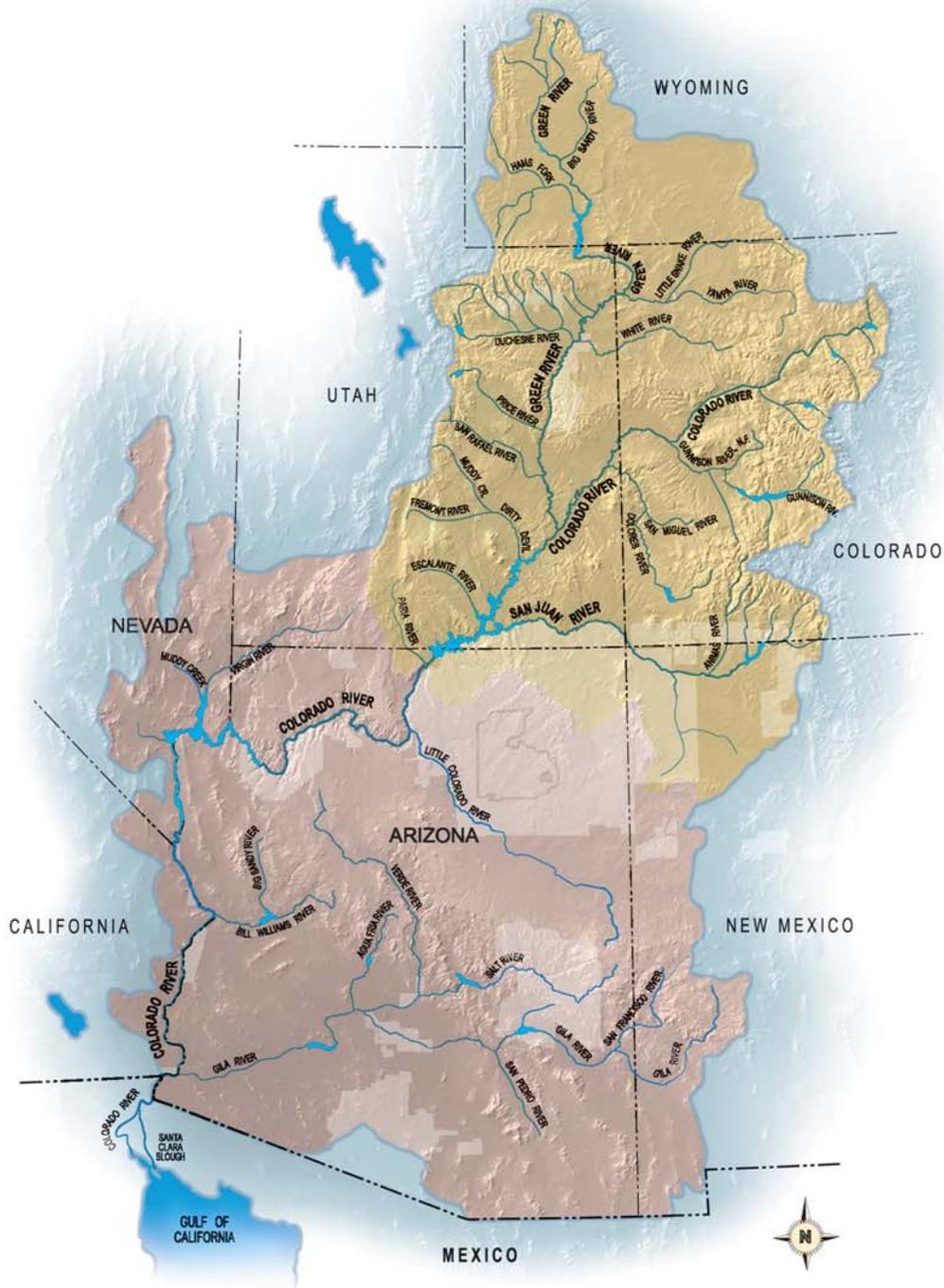


2008 Review

Water Quality Standards For Salinity Colorado River System



July 2008 Draft
Colorado River Basin Salinity Control Forum

2008 REVIEW

**WATER QUALITY STANDARDS FOR SALINITY
COLORADO RIVER SYSTEM**

July 2008

Prepared by
Colorado River Basin Salinity Control Forum

COLORADO RIVER BASIN SALINITY CONTROL FORUM

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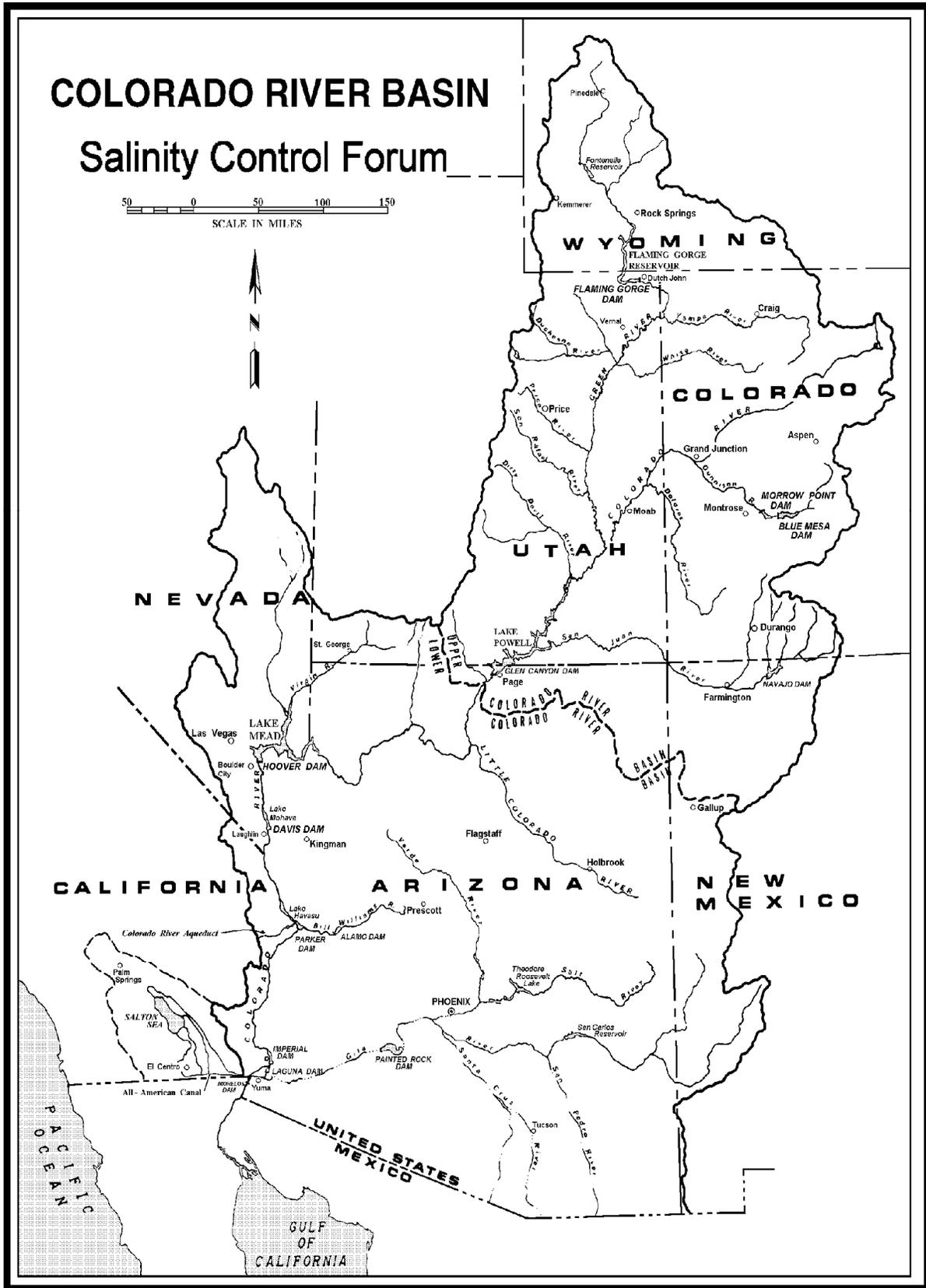
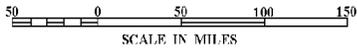
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COLORADO RIVER BASIN

Salinity Control Forum



TRANSMITTAL LETTERS

The Federal Water Pollution Control Act requires that at least once every three years the Basin states review water quality standards relating to the salinity of the waters of the River. The states collectively initiated this review under the auspices of the Forum, prepared a proposed Review and, after holding public meetings, prepared this final Review.

Upon the Forum's adoption of the final Review, it is transmitted by letter to the governors of the individual states for their independent action. The following governors in each of the seven Basin states shall receive this Review:

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State Capitol
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Honorable Bill Richardson
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SUMMARY

This Review is a review of the water quality standards for salinity for the River. Section 303 of the Clean Water Act requires that water quality standards be reviewed from time to time, but at least once during each three-year period. Accordingly, the seven-state Forum has reviewed the existing state-adopted and USEPA approved water quality standards for salinity consisting of numeric criteria and a plan of implementation for salinity control for the River system. During the period of the 2005 Review, Reclamation enhanced its model to include analysis of the River salinity. The model has been used to make new salinity projections for this Review. Upon adoption by the Forum, this Review will be submitted to each of the Basin states for consideration as each state proceeds with its three-year water quality review process.

The Forum recommends no change in the numeric salinity criteria at the three stations located on the lower main stem of the River. The numeric criteria at these stations will remain:

<u>Station</u>	<u>Salinity in mg/L¹</u>
Below Hoover Dam	723
Below Parker Dam	747
At Imperial Dam	879

In past Reviews, the plan of implementation was intended to maintain the salinity concentrations at or below the numeric criteria while the Basin states continued to develop their compact-apportioned waters. Reclamation's computer model runs indicate there is little probability of the numeric criteria being exceeded in the next three years. The Act requires the implementation of salinity control programs to reduce the salinity of the River. Reducing the salinity of the River will reduce economic damages. The plan of implementation accompanying the Review emphasizes the reduction of salinity levels to reduce economic damages in the Lower Basin, as well as providing benefits in the Upper Basin.

The Forum's plan of implementation includes:

1. Completion of Reclamation, BLM, and USDA-NRCS salinity control measures to the extent that each unit remains viable and appropriately cost-effective.
2. Completion of activities implemented under the cooperative agreements between Reclamation and the States of Colorado, Utah, and Wyoming.
3. Implementation of the Forum's recommended and adopted policies for effluent limitations, principally under the NPDES permit program established by Section 402 of the Clean Water Act as amended. The implemented policies (included in Appendix B of this Review)

¹Flow-weighted average annual salinity.

are the following:

Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program;

NPDES Permit Program for Implementation of Colorado River Salinity Standards;

Policy for Use of Brackish and/or Saline Waters for Industrial Purposes;

Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Intercepted Ground Water; and

Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Fish Hatcheries.

4. Implementation of non-point source management plans developed by the states and approved by the USEPA.

The Program is a unique cooperative watershed effort between several federal agencies and seven states designated to meet national, international and state water quality objectives. Item 1 of the plan listed above is to be implemented by federal agencies in conjunction with state, local, and private participants. The Forum works jointly with federal agencies on developing measures to be implemented. The Forum also urges Congress to ensure that the funds necessary to successfully fulfill this plan of implementation are appropriated as needed. Item 2 above involves the expenditure of cost sharing funds required by The Act to be obtained from the Upper Colorado River Basin Fund and the Lower Colorado River Basin Development Fund. Items 3 and 4 above are primarily implemented by each of the Basin states.

The water quality standards involve both a plan of implementation and numeric criteria. With the plan of implementation as proposed in this Review in place, the probability of exceeding the numeric criteria is low based on Reclamation computer model simulations. The analysis indicates the probability of exceedance of the numeric criteria with the plan of implementation in place in the next three years at the Hoover Dam, Parker Dam and Imperial Dam stations is 1% or less. This low probability of exceedance opportunity was an important factor in the Forum's decision to adopt the plan of implementation accompanying this Review.

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List of Abbreviations

208 Plan	Section 208 of the Clean Water Act amendments of 1972 and 1977 requiring integrated area-wide plans and programs for dealing with water pollution problems
Basin	Colorado River Basin
Basin Funds	Lower Colorado River Basin Development Fund and the Upper Colorado River Basin Fund
Basinwide Program	Basinwide Salinity Control Program
BLM	United States Bureau of Land Management
Clean Water Act	P.L. 92-500
Congress	United States Congress
EQIP	Environmental Quality Incentives Program
FAIRA	Federal Agriculture Improvement and Reform Act (P.L. 104-127) (1996)
Forum	Colorado River Basin Salinity Control Forum
FSRIA	Farm Security and Rural Investment Act (P.L. 107-171) (2002)
IBWC	International Boundary and Water Commission
maf	million acre-feet
MGD	million gallons per day
mg/L	milligrams per liter
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PPM	parts per million
Program	Colorado River Basin Salinity Control Program
Reclamation	United States Bureau of Reclamation
Review	2008 Review, Water Quality Standards for Salinity, Colorado River System
River	Colorado River
TDS	Total dissolved solids
The Act	The Colorado River Basin Salinity Control Act (P.L. 93-320) (1974), as amended by P.L. 98-569 (1984), P.L. 104-20 (1995), P.L. 106-459 (2000) and P.L. 110-246
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

PURPOSE OF THE REVIEW

This 2008 Review is prepared and submitted in response to Section 303(c) of the Clean Water Act¹ by the seven-state Forum on behalf of the governors of their respective states. This Review of the water quality standards includes the numeric criteria and the plan of implementation developed and adopted by the Forum. This is the eleventh triennial review conducted by the Forum. Section 303(c)(1) of the Clean Water Act requires that:

The governor of a state or the state water pollution control agency of such state shall from time to time (but at least once each three-year period beginning with the date of enactment of the Federal Water Pollution Control Act Amendments of 1972) hold public hearings for the purpose of reviewing applicable water quality standards and, as appropriate, modifying and adopting standards. Results of such review shall be made available to the Administrator.

This Review is consistent with the USEPA approved 1975 standards and deals only with that portion of the Basin above Imperial Dam. This Review focuses on the 2008 to 2011 period and evaluates the appropriateness of the standards. Background information and activities regarding historical actions relative to the development and adoption of salinity standards is contained in the Forum report, Water Quality Standards for Salinity, Including Numeric Criteria and Plan of Implementation for Salinity Control, Colorado River System, Colorado River Basin Salinity Control Forum, June 1975.

Below Imperial Dam, salinity is controlled as a federal responsibility to meet the terms of the agreement with Mexico contained within Minute No. 242 of the IBWC entitled "Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River." Minute No. 242 requires that measures be taken to assure that River water delivered to Mexico upstream from Morelos Dam will have an average annual salinity concentration of no more than 115 ∇ 30 ppm TDS higher than the average annual flow-weighted salinity concentration of the River water arriving at Imperial Dam.

Nothing in this Review shall be construed to alter, amend, repeal, interpret, modify, or be in conflict with the provisions of the Boulder Canyon Project Act (45 Stat. 1057), the Boulder Canyon Project Adjustment Act (54 Stat. 774), the Colorado River Basin Project Act (82 Stat. 885), the Colorado River Compact, the Colorado River Storage Project Act (70 Stat. 105), the Upper Colorado River Basin Compact, or the Treaty with the United Mexican States (Treaty Series 994).

HISTORY AND BACKGROUND

The Basin is 242,000 square miles² (approximately 155 million acres) of the western United States and a small portion of northern Mexico. Its waters serve some 7.5 million people within the United States' portion of the Basin, and through export provides full or supplemental water supply to another 25.4 million people outside the Basin³. The regional economy is based on irrigated agriculture, livestock grazing, mining, forestry, manufacturing, oil and gas production, recreation and tourism. The river provides irrigation water to about 4.0 million acres within the United States. Hydroelectric power facilities along the

¹Public Law [P.L.] 92-500 as amended.

²Colorado River System, Consumptive Uses and Losses Report, 1996-2000, Bureau of Reclamation

³Computed based on 2000 U.S. Census data

River and its tributaries generate approximately 12 billion kilowatt-hours annually which is used both inside and outside of the Basin. The River also serves about 3 million people and 500,000 irrigated acres in Mexico.

Salinity caused impacts have long been a major concern in the United States and Mexico. The salinity in the River increases as it flows downstream. The river has carried an average salt load of approximately nine million tons annually past Hoover Dam, the uppermost location at which numeric criteria have been established.

The salts in the River system are naturally occurring and pervasive. Many of the saline sediments of the Basin were deposited in prehistoric marine environments. Salts contained within the sedimentary rocks are easily eroded, dissolved, and transported into the river system.

In the 1960's and early 1970's, the seven Basin states⁴ and representatives of the federal government discussed the problem of salinity concentrations increasing in the lower reaches of the River. In a 1971 study⁵, the USEPA analyzed salt loading in the Basin and divided it into two categories, naturally occurring and human-caused. The USEPA concluded that about half (47 percent) of the salinity concentration measured in water arriving at Hoover Dam is from natural causes, including salt contributions from saline springs, ground water discharge into the river system (excluding irrigation return flows), erosion and dissolution of sediments, and the concentrating effects of evaporation and transpiration. The natural causes category also included salt contributions from non-point (excluding irrigated agriculture) or unidentified sources or from the vast, sparsely-populated regions of the drainage, much of which are administered by the BLM or other governmental agencies. Of the land within the Basin, about 75 percent is owned and administered by the federal government or held in trust for Indian tribes. The greatest portion of the naturally-occurring salt load originates on these federally-owned and administered lands. Human activities can influence the rate of natural salt movement from rock formations and soils to the river system and include livestock grazing, wildlife management, logging, mining, oil exploration, road building, recreation and urbanization.

Approximately 53 percent of the salinity concentration in the water arriving at Hoover Dam, as identified by the USEPA, results from various human activities. The USEPA estimated that out-of-Basin exports account for about 3 percent of the salt concentration at Hoover Dam, with irrigation accounting for 37 percent, reservoir evaporation and phreatophyte use accounting for about 12 percent, and about 1 percent attributed to municipal and industrial uses. Much of the salt load contribution from irrigated agriculture is from federally-developed irrigation projects. In 1972, the federal government enacted the Clean Water Act that mandated efforts to maintain water quality standards in the United States. At the same time, Mexico and the United States were discussing the increasing salinity of the River water being delivered to Mexico.

The Basin states established the Forum in 1973. The Forum is composed of representatives from each of the seven Basin states appointed by the governors of the respective states. The Forum was created for interstate cooperation and to provide the states with the information necessary to comply with Section 303(a) and (b) of the Clean Water Act.

⁴Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming

⁵The Mineral Quality Problem in the Colorado River, Summary Report, Environmental Protection Agency, Regions VIII and IX, 65pp., 1971

The USEPA promulgated a regulation in December 1974 which set forth a basinwide salinity control policy for the Basin. The regulation specifically stated that salinity control was to be implemented while the Basin states continue to develop their compact-apportioned water. This regulation also established a standards procedure and required the Basin states to adopt and submit for approval to the USEPA water quality standards for salinity, including numeric criteria and a plan of implementation, consistent with the policy stated in the regulation.

In 1975, the Forum proposed, the states adopted, and the USEPA approved water quality standards which included numeric criteria and a plan of implementation to control salinity increases in the River. The plan was designed to maintain the flow-weighted average annual salinity concentrations at or below the 1972 levels while the Basin states continued to develop their compact-apportioned water supply. Average annual salinity concentrations and salt loads were determined on a flow-weighted basis. The flow-weighted average annual salinity concentration is determined by dividing the flow-weighted average annual salt load passing a measuring station by the total annual volume of water passing the same point during a calendar year. The flow-weighted average annual salt load is calculated by first multiplying the daily salinity concentration values by the daily flow rates. These values are then summed over a calendar year. The total annual volume of water is calculated by calculating the sum of the daily flow rate.

The Forum selected three numeric criteria stations on the main stem of the lower River as being appropriate points to measure the salinity concentrations of the River. These stations are located at the following points: 1) below Hoover Dam; 2) below Parker Dam; and 3) at Imperial Dam.

UNDERSTANDING THE SALINITY OF THE RIVER

As with most large rivers, the natural flow of the River increases from its headwaters to its terminus. Starting at Hoover Dam and moving downstream, today the River flow is reduced by diversions and in normal years only 1.5 million acre-feet is scheduled to pass Imperial Dam. In general, the salinity concentration of the water in the river increases from the headwaters to the terminus. Much of the salt is picked up in the Upper Basin and some of the tributary streams average higher concentrations of salt. A map of the Basin reflecting the relative flows and the corresponding salinity concentrations of the water across the Basin in the 2003 water year is provided for general illustrative purposes in Figure 1. The average flow of the river and its important tributaries is indicated by the width of the line and the salinity concentrations are illustrated by colors coded to ranges in TDS.

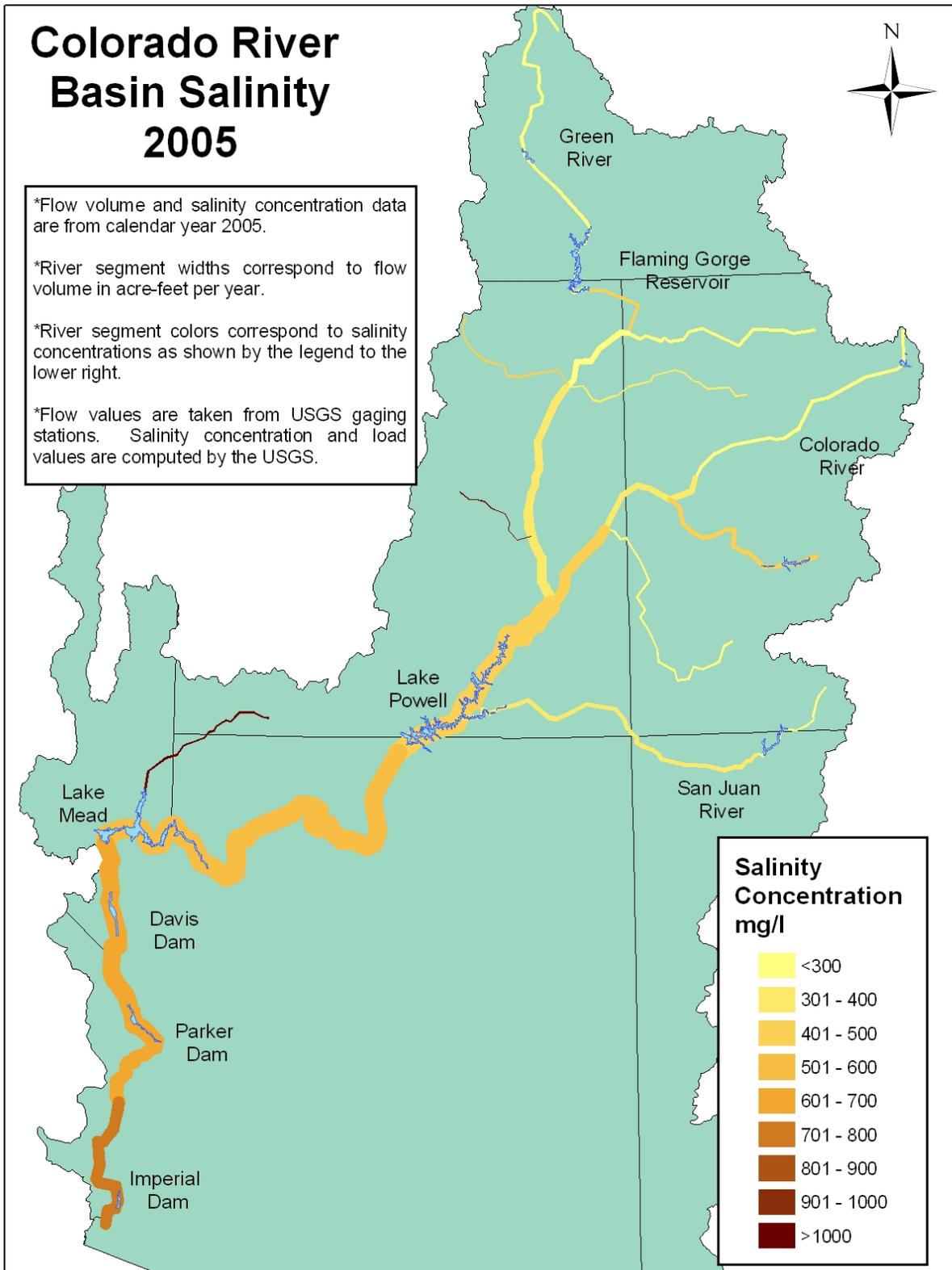


Figure 1 – Water Year 2005 Generalized Flow and Salinity Concentrations across the Colorado River Basin

In general, over the last thirty years the salinity concentrations have decreased at all three of the numeric criteria stations (see Figure 2 and Table 1). In 1970, the concentrations of all three stations were at or above the numeric criteria for those stations. Now the concentrations are well below the numeric criteria. Salinity concentrations are based on TDS as the sum of constituents, whenever possible. The sum of constituents is defined to include calcium, magnesium, sodium, chloride, sulfate, a measure of the carbonate equivalent of alkalinity and, if measured, silica and potassium. If a sum of constituents could not be computed, TDS as residue on evaporation (at 180 degrees Celsius) is substituted. Further, some reported salinity values are based on correlation with specific conductance measurements. In this Review, the terms "salinity," "TDS" and "concentration" in mg/L are used interchangeably.

The concentration of salts measured at the three numeric criteria stations has been increasing over the last few years. This trend can be observed on Figure 2. The recent and significant drought might be a factor with respect to these increases.

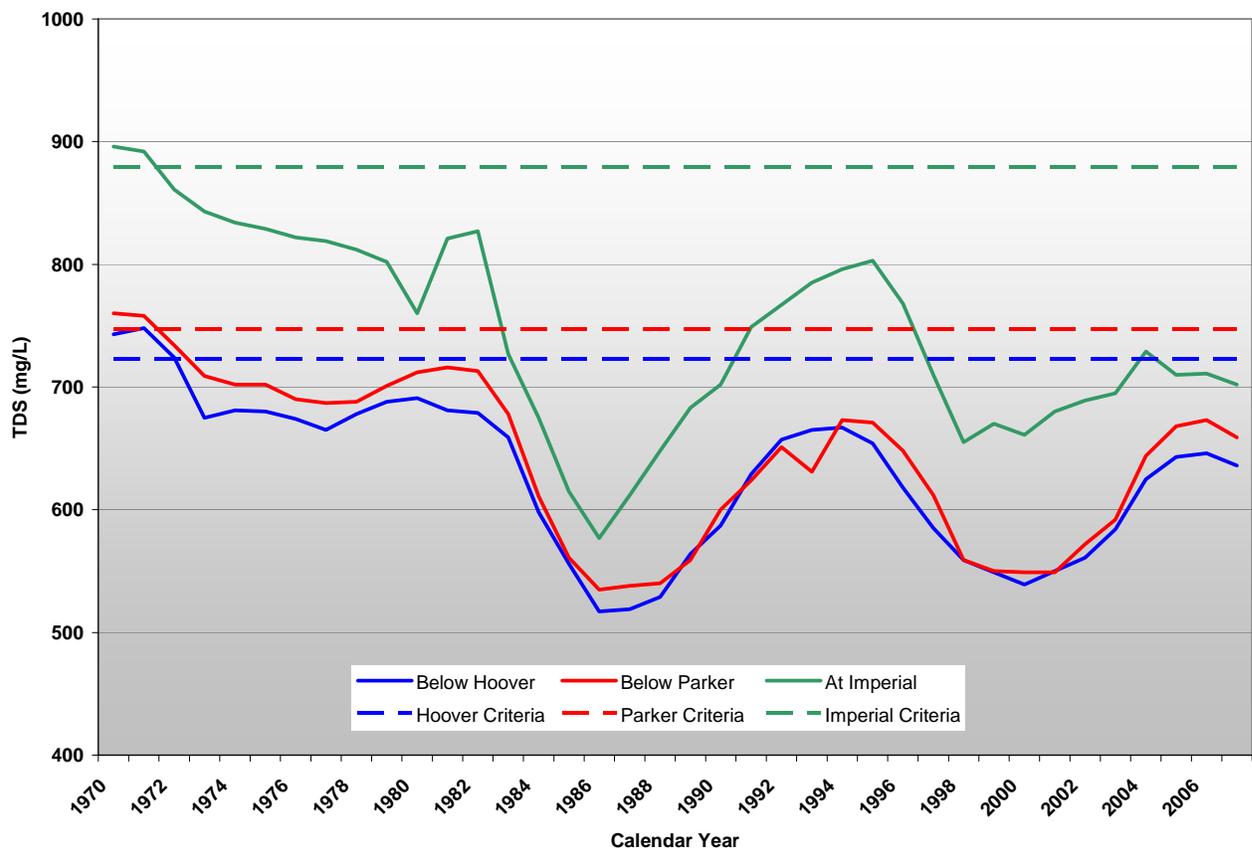


Figure 2 – Salt Concentrations at Numeric Criteria Stations

Table 1
Observed Flow-Weighted Average Salinity
at the Numeric Criteria Stations
(Total Dissolved Solids in mg/L)⁶

Calendar Year	Below Hoover Dam	Below Parker Dam	At Imperial Dam
(Numeric Criteria)	(723 mg/L)	(747 mg/L)	(879 mg/L)
1970	743	760	896
1971	748	758	892
1972	724	734	861
1973	675	709	843
1974	681	702	834
1975	680	702	829
1976	674	690	822
1977	665	687	819
1978	678	688	812
1979	688	701	802
1980	691	712	760
1981	681	716	821
1982	679	713	827
1983	659	678	727
1984	598	611	675
1985	556	561	615
1986	517	535	577
1987	519	538	612
1988	529	540	648
1989	564	559	683
1990	587	600	702
1991	629	624	749
1992	657	651	767
1993	665	631	785
1994	667	673	796
1995	654	671	803
1996	618	648	768
1997	585	612	710
1998	559	559	655
1999	549	550	670
2000	539	549	661
2001	550	549	680
2002	561	572	689
2003	584	592	695
2004	625	644	729
2005	643	668	710
2006	646	673	711
2007 provisional	636	659	702

⁶Determined by the U.S. Geological Survey (USGS) from data collected by the U.S. Bureau of Reclamation and USGS.

PROVISION FOR REVIEWING AND REVISING THE STANDARD

The River water quality standards for salinity and the approach taken by the Basin states in complying with the standards are unique. The salinity concentrations that are projected in the future have not been shown to have adverse effects on human health or wildlife. Thus, the Program is different from most other water quality standards compliance programs. The standards adopted by the Forum, the Basin States and approved by the USEPA consist of the numeric criteria and the plan of implementation. The numeric criteria portion of the water quality standards are established to protect against increases in economic damages to infrastructure and crop production. The plan of implementation is designed to maintain the flow-weighted average annual salinity at or below the numeric criteria while the Basin states continue to develop their compact-apportioned water supply through projects and programs to meet water supply needs.

The Program is a basinwide coordinated effort among federal, state, and local agencies and participants to control salt loading. The Forum, in its statement of Principles and Assumptions for Development of Colorado River Salinity Standards and Implementation Plan, approved by the Forum on September 20, 1974, stated, under Principle 7:

The Plan of Implementation shall be reviewed and modified as appropriate from time to time, but at least once every three years. At the same time, the (numeric) standards, as required by Section 303 (c) (1) of P.L. 92-500 shall be reviewed for the purpose of modifying and adopting standards consistent with the plan so that the Basin states may continue to develop their compact-apportioned waters while providing the best practicable water quality in the Colorado River Basin.

The plan of implementation is not intended to offset the salinity fluctuations that are a result of the River's highly variable annual flows (natural variations in the hydrologic cycle). Analyses have shown that the impact of natural variations in the hydrologic cycle can have a significant impact on salinity. These natural variations in runoff can cause a fluctuation in average annual salinity concentration of as much as 350 mg/L TDS at Imperial Dam. Recognizing the variability of the River, the plan for maintaining the criteria is developed using a long-term mean water supply of 15 maf. When the River flows are at or above the long-term mean, and reservoirs are full, concentrations are expected and have been observed to be below the numeric criteria. Conversely, when flows are dramatically below the long-term mean, and reservoirs are depleted, salinities may increase above the numeric criteria.

Considerable knowledge has been gained through a wide range of research and technical studies since the Forum took this position. Procedures for reducing the volume of saline irrigation return flows have been developed. Reclamation, the NRCS and the Basin states are funding salinity control measures with irrigation districts, canal companies and individual farmers to accomplish salt loading reductions to the River system by improving off-farm and on-farm water delivery systems and water management practices. Additionally, BLM is investigating and implementing measures for reducing salt load contributions from the vast areas of public lands within the Basin managed by the agency.

NUMERIC CRITERIA

As discussed earlier in this Review, the USEPA promulgated a regulation that set forth a basinwide salinity control policy for the Basin. This policy required that the flow-weighted average annual salinity in the lower main stem of the River be maintained at or below the 1972 levels. Three stations: 1) below Hoover Dam; (2) below Parker Dam; and (3) at Imperial Dam are the points in the lower main stem of the River where the flow-weighted average annual salinity is measured. The basis for selecting these stations is their proximity to key diversion facilities on the lower River. Nevada diverts River main stem water from Lake Mead for use in the Las Vegas area. The Metropolitan Water District of Southern California and the Central Arizona Project divert water from Lake Havasu, impounded behind Parker Dam, for millions of water users in southern California and central Arizona, respectively. The large agricultural areas in the Imperial and Coachella Valleys in California and the Yuma area in Arizona are served by diversions at Imperial Dam.

The numeric criteria for each of those stations as established in 1972 are as follows:

Below Hoover Dam	723 mg/L
Below Parker Dam	747 mg/L
At Imperial Dam	879 mg/L

The federal regulations provide for temporary increases above the numeric criteria levels if sufficient control measures are included in the plan of implementation. Should additional water development projects take place beyond those anticipated to occur before control measures are brought on line, temporary increases above the numeric criteria could result. However, these increases will be deemed in conformance with the standards if appropriate salinity control measures are included in the plan. During the next three years, or the period of this review, no increases above the 1972 levels are anticipated.

Since the numeric criteria were adopted in 1974, shifts in water use patterns have occurred in the Lower Basin. While agriculture still remains the predominant user, there has been a shift within this sector from growing mostly low value salt tolerant crops to growing higher value, less salt tolerant crops. Changing markets, increasing land values, escalating production costs, and competition for water supplies drives agricultural producers to higher value crops per unit of land area. Continued control of salinity levels allows the trend to plant and harvest higher value crops to continue. These higher value crops tend to be less salt tolerant overall or are particularly susceptible to some of the salt constituents such as sodium or boron. Because of this shift, the need for water conservation and efficiency within the agricultural sector continues to put an emphasis on reducing salinity. As these shifts continue, there will be more justification to remove additional salt from the water and more emphasis on further reducing the salinity levels below the numeric criteria to reduce the several hundred million dollars in annual damages.

Based on the Forum's findings stated above, this document is the appropriate setting to review the numeric criteria and recommend any changes if necessary. Based on the current use patterns in the Lower Basin and the ongoing progress toward accomplishing all measures identified

in the plan of implementation as described in this Review, the Forum finds the current numeric criteria are adequate for the next three years and recommends no changes at this time.

PLAN OF IMPLEMENTATION

General

A purpose of the plan of implementation is to offset the effects of water resource development and human activities in the Basin after 1972. The plan of implementation is not intended to address the salinity of the River caused by human activity prior to 1972, nor salinity caused by natural variations in river flows.

The probability of exceeding the numeric criteria in a given year was calculated by dividing the number of flow sequences that exceeded the criteria in a given year by the total number of sequences modeled. The probabilities are shown for the first year of the current Review, the first year of the next Review and the last year of the period considered by this Review. Table 2 was created by Reclamation using its River Model. This table shows the calculated probability of exceeding the numeric criteria if only salinity control measures are completed that are now in process. Out year construction of salinity control measures that might be contemplated by a plan of implementation were not included in the analysis that led to the creation of Table 2. It can be observed that the assumption of no future features being constructed does not create concern with respect to exceeding the numeric criteria in 2008 and only a small concern in 2011. However, in 2030, the model predicts a significant risk of exceeding the numeric criteria.

Table 2			
Exceedance of Numeric Criteria Probability			
Without Additional Controls⁷			
Station (Numeric Criteria)	2008	2011	2030
Below Hoover Dam (723 mg/L)	less than 1%	6%	17%
Below Parker Dam (747 mg/L)	less than 1%	6%	21%
At Imperial Dam (879 mg/L)	1%	5%	28%

The plan of implementation is designed to maintain the flow-weighted average annual salinity at or below the numeric criteria. For this Review, the plan of implementation maintains the salinity concentration of the River at or below the numeric criteria through the year 2030. Recognizing the variability in the flow of the River, there is some probability, even with a fully implemented plan of implementation, that the numeric criteria may temporarily be exceeded during periods of reduced flow. However, if average hydrology occurs there will be no exceedances during the period.

⁷Paradox operation assumed terminated before 2030.

The plan of implementation is composed of many actions contemplated by the federal government and many of its agencies, and by each of the seven Basin states and many of their agencies. The plan includes projects that remove the required salt tonnage. This will principally be accomplished by reducing the salt contributions to the River from existing sources and minimizing future increases in salt load caused by human activities. For this Review, the plan of implementation can be briefly summarized as follows:

1. Completion of Reclamation, USDA, and BLM salinity control measures to the extent that the measures remain viable and appropriately cost-effective.
2. Completion of activities implemented under the cooperative agreements between Reclamation and the States of Colorado, Utah, and Wyoming.
3. Implementation of the following Forum recommended and adopted policies (the text of policies are included in Appendix B of this Review).

Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program

NPDES Permit Program for Implementation of Colorado River Salinity Standards

Policy for Use of Brackish and/or Saline Waters for Industrial Purposes

Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Intercepted Ground Water

Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Fish Hatcheries

4. Implementation of non-point source management plans developed by the states and approved by the USEPA.

Item 1 of the list above is to be implemented by federal agencies in conjunction with state, local and private participants. The Forum participates with federal agencies in developing the measures to be implemented. The Forum also urges Congress to appropriate the funds needed for implementation and recommends legislative changes when necessary. Funding for item 2 is initiated by cost sharing on funds spent by the federal agencies. Items 3 and 4 above are primarily implemented by each of the Basin states.

Federal Programs

Congress enacted The Act (Public Law (P.L. 93-320) in June of 1974 with the Forum's support. Title I of The Act addresses the United States' commitment to Mexico and provided the means for the United States to comply with the provisions of Minute No. 242. Title II of The Act created a water quality program for salinity control in the United States. Primary responsibility for the federal program was given to the Secretary of the Interior, with Reclamation being instructed to investigate and build several salinity control units. The Secretary of Agriculture was instructed to support the effort within existing authorities.

The Act was amended in 1984 by P.L. 98-569 to authorize two additional units for construction by Reclamation and directed the BLM to implement a comprehensive program to minimize salt loading in the Basin. The amendments directed the Secretary of the Interior and the Secretary of Agriculture to give preference to the salinity control units with the least cost per unit of salinity reduction. The Act was also amended to establish a voluntary on-farm salinity control program to be implemented by the USDA and provided for voluntary replacement of incidental fish and wildlife values foregone on account of the on-farm measures. Many cost-effective salt-load reducing activities have been accomplished since that authorization.

Reclamation may implement a variety of effective salinity control measures, but most projects concentrate on improving the efficiency of off-farm irrigation delivery systems. The Act was amended by P.L. 104-20 to authorize the Basinwide Program. The Basinwide Program uses a competitive process that has greatly increased the federal cost effectiveness of salinity control. P.L. 106-459 increased the authorization ceiling for Reclamation's salinity control program.

The USDA program generally concentrates on improving on-farm systems. The FAIRA of 1996 (P.L. 104-127) changed how the USDA participates in the salinity control program by creating a new conservation program which combined four conservation programs, including the USDA's program. The FSRIA of 2002 (P.L. 107-171) reauthorized the EQIP through 2007 that significantly increased funding levels.

The Act, as amended, required the states to cost-share the salinity control based on federal funds expended by both the Basinwide Program and the EQIP. These cost sharing dollars are provided by the Basin Funds. In 2008, The Act was amended to better describe how this cost sharing is to occur and the effort was titled by the amendments as the Basin States Program. This cost sharing effort is further described in the State Cost Sharing and Cooperative Agreements section of this Review.

The goal of the BLM program is to reduce the contribution of salts to the River from BLM-administered public lands. Salt reduction is achieved by controlling both point and non-point sources of salt contributions, however, the majority of salt derived from public lands is of non-point-source origin.

NPDES permits are issued by the USEPA for New Mexico. The USEPA also issues NPDES permits for Indian tribes in the Basin. Salinity discharge requirements for these permits are reviewed and added where needed during the permit re-issuance process.

The plan of implementation recognizes that the Forum, participating federal agencies, and the Basin states each have specific responsibilities for furthering the Program. The Forum will continue to provide overall coordination and a continuing review of salinity changes, program effectiveness, and the need to make further program changes and improvements.

Table 3 gives a brief summary of the federal Program accomplishments to date and identifies potential future measures. It is estimated that there has been a reduction in salt loading of 1,080,100 tons per year. Once the Paradox Unit's useful life was reached, prior to 2030, its salt loading reduction fell out and thereafter was not in the probability analyses presented herein. The plan of implementation calls for a continuation of the federal programs. On Table 3, it can be noted that with time that continued effort will reduce a total of 1,864,600 tons of salt.

Table 3
Summary of Federal Salinity Control Programs

UNIT	TONS PER YEAR
MEASURES IN PLACE BY Reclamation	
Basinwide Program	250,000
Meeker Dome	48,000
Las Vegas Wash Pittman	3,800
Grand Valley	122,300
Paradox Valley	113,000
Lower Gunnison Winter Water (USBR)	41,400
Dolores	23,000
SUBTOTAL	601,500
MEASURES IN PLACE BY USDA (2007)⁸	
Grand Valley	89,900
Price-San Rafael	41,900
Uinta Basin	137,500
Big Sandy River	56,000
Lower Gunnison	87,700
McElmo Creek	21,200
Mancos	1,600
Muddy Creek (USDA)	0
Manila	1,000
Silt	1,200
SUBTOTAL	438,000
MEASURES IN PLACE BY BLM	
Nonpoint Sources ⁹	26,000
Well-Plugging	14,600
TOTAL	1,080,100
POTENTIAL NEW MEASURES	
Reclamation Basinwide Program	400,000
Price San Rafael (Reclamation/USDA)	105,000
Grand Valley (USDA)	42,100
Uinta Basin (USDA)	25,500
Big Sandy River (USDA)	27,700
Lower Gunnison (USDA)	98,300
McElmo Creek (USDA)	24,800
Mancos River (USDA)	10,300
Muddy Creek (USDA)	11,700
Manila	16,300
Silt	2,800
Unidentified	20,000
New Well Plugging and Nonpoint Source	Unknown
SUBTOTAL (rounded)	784,500
TOTAL(rounded)	1,864,600

⁸ May include off-farm controls that were not goaled

⁹ BLM non-point source are estimates depicting of potential opportunities

States Cost Sharing and Cooperative Agreements

In 2008, The Act was modified to create, by name, a program for the required cost sharing from the Basin Funds for federal expenditures. The newly named program is called the Basin States Program. The amendments to The Act, in bill form, are provided in this Review as Appendix A. The Basin States Program will provide for how funds are to be expended with regard to the required cost sharing by the states for the federal expenditures under Reclamation's Basinwide Program and the NRCS EQIP. This cost sharing has been occurring and is at about \$10 million to \$13 million each year. The Act requires that the Basin Funds provide 30% of the total funding for the Program. Before the Basin States Program can begin, Reclamation must submit a report to Congress. That report is currently being drafted but may not be submitted to Congress until 2009.

In order to take full advantage of the cost sharing opportunities provided by The Act, Reclamation has entered into cooperative agreements with the States of Colorado, Utah, and Wyoming. These agreements provide for the use of Basin Funds. These agreements allow the states to enter into contracts with other entities to achieve salinity control utilizing funds generated by the cost-share provision of The Act. Each state administers its agreement a little differently but all have the same goal of providing salinity control in the most cost-effective manner. These agreements have proven very useful as a means of supplementing the activities of the federal agencies.

Forum and States' NPDES Permits

An important component of the plan of implementation for salinity control is the Basin states' activities associated with the control of salt discharge to the River through Forum policies and the states' NPDES permits. In 1977, the Forum adopted the Policy for Implementation of Colorado River Salinity Standards Through the National Pollution Discharge Elimination System (NPDES) Permit Program. This policy provides guidance for the regulation of municipal and industrial point source discharges of saline water. The Forum approved needed changes to its NPDES policy on October 30, 2002. In 1980, the Forum adopted a policy to encourage the use of brackish and/or saline waters for industrial purposes where it is environmentally sound, and economically feasible. A third policy dealing with intercepted ground water was adopted by the Forum in 1982. In 1988, the Forum adopted a fourth policy which addresses the salinity of water discharges from fish hatcheries. These policies are found in this report in Appendix B.

Each of the states has adopted the Forum policies presented in Appendix B. A listing of the NPDES permits in force within the Basin is presented in Appendix C. Some NPDES permits are issued by the USEPA for federal facilities and on Indian reservations. The Forum policies also apply to these USEPA permits and, hence, this USEPA effort is a part of the plan of implementation. The USEPA issue permits can be found in Appendix D of this report. During the period of this review, the status of implementation of the NPDES permits and the water quality management plans in each of the states is as follows:

State Water Quality Management Plans

Arizona

Scope

The Colorado River enters Arizona (and the Lower Basin) near Page, travels through the Grand Canyon before turning southward at Lake Mead (Hoover Dam) and flowing to the Gulf of California. There are four major drainages entering the river as it passes through Arizona: 1) the Little Colorado River which drains east-central Arizona, crosses the Navajo Reservation before emptying into the Colorado River approximately 50 miles south of the Utah border; 2) the Virgin River which cuts across the northwest corner of Arizona from Utah before entering Lake Mead; 3) the Bill Williams River, formed by the Big Sandy and the Santa Maria Rivers at Alamo Lake, which empties into the Colorado River above Parker Dam, and 4) the Gila River, which drains central and southern Arizona and joins the Colorado River near Yuma, below Imperial Dam.

NPDES Permitting

Since December 2002, when Arizona received delegation of the NPDES permitting program from the USEPA, the Water Quality Division of the Arizona Department of Environmental Quality has administered the Arizona Pollutant Discharge Elimination System program on non-Indian country lands. All major permits for municipal and industrial discharges, with direct river discharges, are written in conformance with the associated Forum policies. The agency continues to evaluate and revise other discharge permits as information becomes available.

Currently there are 14 active, individual Arizona discharge permits holders in the non-tribal portion of the River system. Of these, 12 are for industrial discharges related to mining, power plants, fueling stations and one federal fish hatchery. There are 29 permits associated with municipal water treatment and/or wastewater discharges. These facilities serve a total population of approximately 180,000 people. A specific listing of the individual permits and the status of compliance with Forum policy is contained in Appendix C.

Of the 21 federally recognized tribes in Arizona, 7 tribes have lands within the drainage of the Basin and 4 tribes currently hold a total of 24 NPDES permits. These permits are issued and administered by the USEPA Region 9 in San Francisco. Twelve permits are for community wastewater treatment facilities, ten are for domestic wastewater discharges from boarding schools, and two are for mining operations (one for coal and one for copper). There are 7 other permits issued to various non-tribal entities with facilities located on tribal lands.

Water Quality Assessments and TMDLs (Total Maximum Daily Loads)

In general, water quality in the Arizona portion of the Basin is good to very good. There are currently only 15 stream segments in the basin that are listed in the state's 2004 Section 303(d) report as impaired (4 – Bill Williams; 5 – Colorado River Mainstem; 6 – Little Colorado River). No waters are currently listed for salinity related impacts. The primary causes of impairment (a water body may be impaired for more than one pollutant) are sediment (9), selenium (4), pathogens (1)

and trace metals (4), including mercury. Complete assessment information can be found on the agency's website at:

<http://www.azdeq.gov/environ/water/assessment/assess.html>

Watershed Planning

Some of these water quality issues are being addressed through locally-led watershed management efforts funded through Arizona's 319 grant program. The Arizona Department of Environmental Quality is in the process of finalizing comprehensive watershed-based plans for several watersheds in the state, including the Bill Williams watershed. These plans will contain the USEPA's required 9 elements to achieve the highest ranking for possible funding under the Clean Water Act 319 program. In addition, the plans contain implementation strategies for many of the impaired waters, as well as Best Management Practices to address existing and potential issues in the watershed.

California

NPDES Permits

The California Regional Water Quality Control Board, Colorado River Basin Region issues the NPDES permits for navigable waters and Waste Discharge Requirements for land discharges within the River drainage portion of the state. In issuing and reissuing waste discharge requirements, the Regional Board complies with all Forum policies. In addition, the Regional Board has included in the discharge permit requirements for land discharges a prohibition against brine backwash from water softeners into evapo-percolation ponds which overlie ground waters which are in hydraulic continuity with the River system. Industrial discharges are to be confined in impervious evaporation basins.

Water Quality Management Planning

The Water Quality Control Plan for the Basin was adopted by the Regional Board in November 1993. Following public hearings, the updated plan was adopted by the Regional Board and approved by the State Water Resources Control Board in February 1994. The revised plan became effective upon approval of the Office of Administrative Law in August 1994. The salinity control component of the Water Quality Control Plan is consistent with the Forum's plan of implementation for salinity control. The Regional Board is working with local entities and the Colorado River Board of California to ensure that implementation of the water quality plan is achieved.

In March 2008, the Regional Board completed the 2007 Triennial Review of the Water Quality Control Plan. The purpose of this review is to reaffirm and/or revise water quality objectives and beneficial uses for ground and surface waters, and evaluate the adequacy of the Basin Plan for protecting water quality. Several projects that require Basin Plan amendments are underway and include TMDLs for the Salton Sea, New River, Alamo River, Coachella Valley Stormwater Channel, and the Palo Verde Outfall Drain. Recently adopted amendments include a Silt TMDL for the Imperial Valley Drains, and a Trash TMDL for the New River.

Other Activities

State Water Resources Control Board Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling, Resolution No. 75-58 establishes priorities for the use of poor quality waters for cooling of inland power plants, and has been in effect since 1975. The State Water Resources Control Board has included salinity control in the River among its top priority items.

Colorado

Scope

Colorado's portion of the Basin is comprised of six major drainages: 1) the main stem of the River from the Continental Divide to the Utah border; 2) the Roaring Fork River Basin; 3) the Yampa/White River Basin which flows to the Green River in Utah; 4) the Gunnison River Basin; 5) the Dolores River which flows to the main stem in Utah; and 6) the San Juan River which flows into New Mexico.

NPDES Permitting

The Colorado Department of Public Health and Environment, Water Quality Control Division administers the NPDES permitting program in the Basin, with the exception that the USEPA issues permits for point source discharges on the Southern Ute and Ute Mountain Ute Reservations. This would include permits for discharges to ground water that would contribute salinity to the River system through a hydrologic connection to surface waters. Permits for industrial and municipal discharges are written in conformance with the associated Forum policies. In 2006, the Colorado Water Quality Control Commission ruled that construction of oil and gas development sites and related infrastructure (e.g. roads) of one or more acres of disturbance are required to obtain stormwater permit coverage, even though the Energy Policy Act had exempted this activity from the requirement to obtain a permit at the federal level.

Currently there are more than 350 active discharge permits in the Colorado portion of the Basin. A specific listing of the individual permits and compliance status is contained in Appendix C.

Water Quality Assessments and TMDLs

The waters in Colorado's portion of the Basin are generally of good quality. Twenty-seven stream segments in the lower portion of the system (12 - Gunnison; 8 - main stem and tributaries of the River; and 7 - White/Yampa) are included on the 2008 303d List of Impaired Waters for selenium, caused by both natural sources and irrigation of land that sits on marine shale, primarily the Mancos. Twenty-five stream segments in the mountainous portions of the Basin (10 - Gunnison; 4 - San Miguel; 3 - Dolores; 4 - Blue/Snake and Eagle - 4) are listed for metals, primarily caused by the remnants of historic mining activities. No waters are currently listed for salinity related impacts.

Watershed Planning

The Upper Basin in Colorado has several watershed planning projects in progress. The potential water quality impacts of headwater diversions to Colorado's Eastern Slope are being examined. There is an on-going study of stream flows and their impact upon water quality in the Roaring Fork watershed and a comprehensive watershed plan is nearing completion. Each of the towns and cities in the Roaring Fork watershed also have been making improvements in their stormwater management programs, even though they are not currently required to obtain the Phase II municipal stormwater permit. The City of Aspen has recently formed a stormwater utility that will sponsor construction and maintenance of stormwater best management practices.

Development of coal bed methane continues to be a major activity in the Basin. More oil and gas development projects are obtaining a discharge permit for process water discharges under section 402 of the Clean Water Act.

Several watershed planning efforts are underway or already exist in the Basin in Colorado. Most of these are associated with the Clean Water Act Section 319 grant program requirements. New plans for the Dolores, Mancos, Uncompahgre and Lower Animas Rivers are in formative stages. These plans are designed to meet the 9 required elements for a nonpoint source watershed based plan as described by the USEPA.

The Gunnison River Basin Selenium Task Force and the Grand Valley Selenium Task Force are working on watershed plans which focus upon the need to address water quality impacts from selenium. The USGS recently completed a selenium loading analysis for the Gunnison Basin which will provide the technical basis for a series of TMDLs currently under development by the Water Quality Control Division. The task forces are targeting irrigation improvement projects to achieve significant selenium and salinity loading reductions.

Nevada

Scope

The Basin within Nevada consists of 12,376 square miles, with the major tributaries being the Virgin and Muddy Rivers and the Las Vegas Wash. All of these tributaries flow into Lake Mead and provide nearly all of the inflow to the River from Nevada.

NPDES Permitting

The USEPA has delegated the Nevada Division of Environmental Protection the authority to issue NPDES Permits. Currently there are approximately 37 active discharge permits in the Nevada portion of the Colorado River System. The largest dischargers, the City of Las Vegas and the Clark County Water Reclamation District, and the City of Henderson were issued new discharge permits in July 2001. The permits allow a flow up to 91 MGD for the City of Las Vegas, 110 MGD for the Clark County Water Reclamation District and 42.5 MGD for the City of Henderson. The qualities of the waters affected by these permits are closely monitored and all necessary programs to protect

water quality standards will be implemented. Nevada continues to apply the policies adopted by the Forum.

Water Quality Management Planning

Area-wide water quality management planning duties and powers have been vested to certain counties. The Clark County Board of Commissioners was designated the Area-Wide Water Quality Management Planning organization within Clark County. The initial 208 Plan was adopted by the Clark County Board of Commissioners in 1988 and was approved by the USEPA.

Subsequently, in 1997, the Clark County Board of Commissioners adopted the Las Vegas Valley 208 Water Quality Management Plan Amendment. The Las Vegas Valley 208 amendment included updates to planning area boundaries, wastewater flow projections, reclaimed water demands, nonpoint source management, Las Vegas Wash Wetlands planning, integrated planning coordination, and overall water quality planning.

The main purpose of this 208 Plan Amendment is to:

- Revise the 1990 208 Plan Amendment
- Include effects of sustained regional growth and development
- Revise stormwater permitting to a more inclusive nonpoint section
- Provide water quality planning to a horizon year of 2020

The Las Vegas Valley 208 Plan Amendment was further updated in 2001 to include the Areawide Reuse Study, and the Comprehensive Adaptive Management Plan for the Las Vegas Wash.

Clark County adopted the Northeast Clark County 208 Plan in June 2000. The amendment area is located in the northeast area of the county, including the communities of Bunkerville, Logandale, Overton, Moapa, Moapa Valley, and the City of Mesquite. Two tributaries to the River are located in the area, the Muddy and Virgin Rivers. The Virgin River is currently listed on the State's 303d list. Both rivers have aquatic endangered species and drain into Lake Mead.

In 2007, the Amendment to the Northeast Clark County 208 Plan was adopted and approved by the USEPA. The main purposes of this amendment are: 1) acknowledge a lack of wastewater management options in northeast Clark County; 2) amend the 2000 Northeast Clark County Water Quality Management Plan primarily to allow for the options of package wastewater treatment plants. The South Clark County Water Quality Management Plan was adopted in 1988 and amendments were made for Lake Las Vegas in 1988 and for Laughlin in 1988. The current Clark County area-wide 208 Plan Project will combine the 5 existing Clark County regional Water Quality Management Plans into one integrated Clark County area-wide 208 Plan. Work is in progress and is scheduled to be completed in 2008.

Local government entities within urban Clark County are also participants in the NPDES Stormwater Quality Management Committee to identify and implement measures to meet state

stormwater permitting requirements. Future 208 amendments are expected to address gray water issues and shallow ground water issues, to update population projections, and to incorporate best management plans identified in the stormwater permit for the Las Vegas area entities.

Other Activities

A program has been developed by the Clark County Water Reclamation District, the City of Las Vegas, and the City of North Las Vegas to coordinate, investigate, and encourage the implementation of management practices resulting in reduction of wastewater salinity. The principal emphasis of this program will be directed toward salinity control to meet the requirements of the NPDES permits issued to Clark County, the City of Las Vegas, and Henderson.

New Mexico

Scope

New Mexico's portion of the Basin above Imperial Dam is comprised of two major main stem drainages: 1) the Puerco River, which is a tributary of the Little Colorado River; 2) the San Juan River, a major tributary of the River that reenters Colorado prior to draining into Lake Powell on the Arizona-Utah border.

NPDES Permitting

In New Mexico, authority for issuing permits is administered by the USEPA Region VI, except for facilities located on the Navajo Indian Reservation, which are administered by Region IX. All permits for industrial and municipal discharges are written in conformance with the associated Forum policies. Currently, there are 37 active discharge permits in the New Mexico portion of the River system, of which Region VI administers 25 permits and Region IX administers 12 Navajo Reservation permits. Of these, 21 permits (20 non-Indian, 1 Navajo) are for industrial discharges and 16 permits (5 non-Indian, 11 Navajo) are associated with municipal wastewater discharges.

Water Quality Assessment and TMDLs

The New Mexico Water Quality Control Commission has adopted the framework for water quality in New Mexico, which includes the State of New Mexico Water Quality Management Plan and the New Mexico Nonpoint Source Management Plan. Both plans cover the entire state except for that portion of the Navajo Reservation lying therein. Planning within the reservation is the sole responsibility of the Navajo Tribe. Much of the Basin in New Mexico falls within the boundaries of the reservation.

The following TMDLs have been adopted by the New Mexico Water Quality Control Commission and approved by the USEPA within the New Mexico portion of the Basin at this time.

- Animas River: fecal coliform, nutrients

- Gallegos Canyon: selenium
- LaPlata River: fecal coliform & siltation
- LaPlata River: dissolved oxygen
- San Juan River: fecal coliform & sedimentation/siltation

Watershed Planning

Work plans are developed and grant funding secured under Clean Water Act Section 319(h) for watershed associated development, riparian area restoration, certification of Section 404 permits, spill response, and treatment of abandoned mines. The work plans identify and coordinate efforts by state, federal, and local agencies, along with other groups and private citizens to reduce or prevent non-point source pollution and implement best management practices to reduce non-point source pollutants. The New Mexico Environment Department and the BLM have recently entered into a Memorandum of Agreement to implement a roads maintenance education project for oil and gas operators working within the Largo Canyon watershed. The project is intended to reduce the hydrologic impacts of roads and is jointly funded by the 319(h) program and industry in-kind contributions of labor and equipment. State Revolving Loan Funds and other funds are authorized and available for use in funding salinity control projects. State actions in support of salinity control include: 1) inclusion of salinity control measures in the Section 208 plans; 2) dissemination of information on salinity sources and control; 3) consultation with industries on potential salinity reduction measures; 4) implementation of Forum policy through NPDES permits; 5) maintaining a continuous water quality planning program whereby new or additional salinity control measures can be addressed.

Utah

Scope

Utah's portion of the Basin is comprised of 9 major sections: 1) the main stem of the Colorado River from the Colorado border to the Arizona Border in Lake Powell; 2) the Green River Basin from the Wyoming State Line in Flaming Gorge Reservoir to the confluence with the River; 3) the Duchesne River Basin; 4) the lower Yampa and White River Basins which flow to the Green River in Utah; 5) the Price and San Rafael River Basins; 6) the Dirty Devil and Escalante Rivers; 7) the lower portion of the San Juan Basin which flows the main stem in Utah; 8) the Paria River; 9) the Kanab Creek Basin to the Arizona State Line; 10) the Virgin River Basin to the Arizona state line.

NPDES Permitting

The Utah Division of Water Quality within the Utah Department of Environmental Quality administers the NPDES permitting program in Utah. Permits for industrial and municipal discharges are written in conformance with the associated Forum policies.

As of Dec 31, 2007, there are 76 active discharge permits issued in the Utah portion of the Basin. Of these, 32 are for municipal discharges and 44 are for industrial discharges. A specific listing of the individual permits and their compliance status is contained in Appendix C. By early

2006, a total of 5 discharge permits for coal mining operations in Utah were developed to offset salinity contributions from industrial sources in accordance with the Forum policy adopted as part of the 2002 Review. The salinity-offset project plans for all 5 coal mine facilities have been finalized with projects currently being implemented to offset salinity contributions in excess of the one-ton per day requirement.

Water Quality Assessments and TMDLs

The waters in Utah's portion of the Basin are generally of good quality. There have been 23 stream segments listed for impacts from salinity/TDS/chlorides. These segments are generally in the lower reaches of the respective basins and are the result of a combination of natural salt loadings, as well as agricultural drainage. TMDLs have been developed to address these salinity/TDS/chloride impairments. For information about the completed studies and to view the current Utah 303(d) list of impaired water bodies, please visit www.waterquality.utah.gov/TMDL.

Watershed Planning

Utah's Watershed Management and Planning program is focused on protecting and restoring the water quality of its streams, lakes and ground water resources by employing the following key elements; Stewardship, Monitoring and Assessment, Coordination and Watershed Planning. Although projects exist in other regions, currently the Upper Basin region in Utah has no watershed planning projects in progress for water quality. The Basin Plans for the Utah State Water Plan include water quality as part of the process and these plans are updated periodically.

Wyoming

Scope

Wyoming's portion of the Basin is comprised of 2 major main stem drainages: 1) the Little Snake River, which is a tributary of the Yampa River in Colorado; 2) the Green River which empties into Flaming Gorge Reservoir on the Wyoming-Utah border.

NPDES Permits

The Wyoming Department of Environmental Quality, Water Quality Division administers the NPDES permitting program within the Basin in Wyoming. There are no Indian lands situated within the River drainage in Wyoming. All permits for industrial and municipal discharges are written in conformance with the associated Forum policies.

Currently there are 44 active discharge permits in the Wyoming portion of the River system. Of these, 19 are for industrial discharges related to coal mines, power plants or oil and gas production facilities. The largest discharge is from PacifiCorp's Naughton Power Plant which discharges approximately 6 tons/day of salt into the Ham's Fork, a tributary of the Green River near Kemmerer. There are also 20 permits associated with municipal wastewater discharges. These

facilities serve a total population of approximately 50,000 people. A specific listing of the individual permits and compliance status is contained in Appendix C.

Water Quality Assessments and TMDLs

In general, water quality in the Wyoming portion of the Basin is good to very good. There are currently only 12 streams and rivers identified as either impaired or threatened in the state's 2008 Section 303(d) list (10 pollutant/segment combinations on 6 streams/rivers in the Green River Basin, 9 pollutant/segment combinations on 6 streams in the Little Snake River Basin). No waters are currently listed for salinity related impacts. Complete assessment information can be found at: <http://deq.state.wy.us/wqd/watershed/index.asp>.

Watershed Planning

Most of the water quality issues mentioned above are currently being addressed through locally-led implementation of watershed management plans funded through Wyoming's Clean Water Act Section 319 Grant Program and other state and federal cost-share programs. The Wyoming Department of Environmental Quality has scheduled development of TMDLs to begin on 6 of the listed streams and rivers (9 pollutant/segment combinations) in 2008 and 2009. In addition, the Wyoming Water Development Commission and Wyoming State Engineer's Office, with assistance from the University of Wyoming's Water Resources Data System, are engaged in a statewide water planning process and are currently preparing a revised river basin water plan for the Green and Little Snake drainages. The February 2001 water planning report presented current and proposed (estimated) future uses of water in Wyoming's Green River and Little Snake Basins. This information is being updated during the current effort, along with other useful information, including irrigated lands delineation, hydrologic modeling of major streams, current use determinations for all water use categories, future use projections, water development opportunities identification, and related activities. Detailed information can be accessed at: <http://waterplan.state.wy.us>.

Effect of the Plan of Implementation

At the request of the Forum, Reclamation made an additional run of its river model which calculated the probability of exceeding the numeric criteria if the plan of implementation as outlined in this Review were to be constructed. Table 4 provides the results of that model run. When Table 2 is compared with Table 4, it can be noted that the probability of exceeding the numeric criteria is greatly reduced by the implementation of the plan. For example, at Hoover Dam in 2030 the probability of exceeding the numeric criteria in 2030 is 17% without the implementation of the plan. With the plan being implemented, the probability in 2030 is dropped to 2%.

Table 4¹⁰			
Exceedance of Numeric Criteria Probability			
With Plan of Implementation			
Station (Numeric Criteria)	2008	2011	2030
Below Hoover Dam (723 mg/L)	less than 1%	3%	2%
Below Parker Dam (747 mg/L)	less than 1%	4%	1%
At Imperial Dam (879 mg/L)	1%	4%	3%

CONCLUSION AND ADOPTION OF THE STANDARDS

The Forum adopted this draft Review. The Forum and the states remain committed to continued improvement of the water quality of the River. The federal agencies are a critical part of the Program. It is expected that by their involvement in the preparation of this Review, those federal agencies will support the plan of implementation and its programs.

The Standards consist of two components, the numeric criteria and the plan of implementation. No change has been made in the numeric criteria since their adoption in 1975 by the Basin states and approval by the USEPA. After having conducted this Review, the Forum has again found the numeric criteria to be appropriate and recommends no changes in these criteria. The Forum also finds that the updated plan of implementation is adequate to keep the salinity concentration of the River at or below the numeric criteria through 2030.

As water development occurs throughout the Basin, salinity concentrations and the associated economic damages will increase. An aggressive salinity control program is needed to reduce these damages. The Program, while continuing to maintain salinity concentrations at or below the numeric criteria, will focus on the opportunities to further reduce future economic damages. The Forum will continue to advance an aggressive program over the next decade to continue to control as much salt loading as economically justifiable.

The Program is truly a unique program and it cannot be successful without the cooperation of a multitude of agencies and governments involved at the local, state and federal levels. First, the program is reliant upon the cooperation of land owners in implementing important and cost-effective salinity control measures. Secondly, the program is dependent on a multitude of agreements among the seven Basin states which have always been accomplished by consensus. Lastly, the program depends upon the cooperation of a number of federal agencies for its success. In addition to the three federal implementing agencies, there are other federal agencies which are involved in the Program and cooperation and coordination with these agencies is also essential. Three agencies are notable; the USFWS, the USGS and the USEPA.

¹⁰ Paradox operation assumed terminated before 2030.

The summer of 2008 will be spent receiving comments on this draft Review. In the fall of 2008, the Forum will again meet and adopt a final Review. After the final adoption of this Review by the Forum, each of the seven Basin states will include the Review as a part of its own water quality standards and, through procedures established by each state, consider the Review for adoption and submittal to the appropriate regional office of the USEPA for approval. Because the Basin contains portions of three USEPA regions, the States of Utah, Colorado and Wyoming will make submittals to the USEPA Region VIII in Denver, Colorado; New Mexico to the USEPA Region VI in Dallas, Texas; and Nevada, Arizona and California to the USEPA Region IX in San Francisco, California. It is anticipated that the USEPA, by approval of the states' submittals, will fully support this salinity control effort.

APPENDIX A

2008 Amendments to the Colorado River Basin Salinity Control Act

The appendix is Sec. 2806 – Use of Funds in Basin Funds for Salinity Control Activities
Upstream of Imperial Dam

as found in the

Conference Report of the
House of Representatives
concerning the

Food, Conservation, and Energy Act of 2008
(Farm Bill)
H.R. 2419
(P.L. 110-246)

SEC. 2806. USE OF FUNDS IN BASIN FUNDS FOR SALINITY CONTROL ACTIVITIES UPSTREAM OF IMPERIAL DAM.

(a) In General- Section 202(a) of the Colorado River Basin Salinity Control Act (43 U.S.C. 1592(a)) is amended by adding at the end the following new paragraph:

`(7) BASIN STATES PROGRAM-

`(A) IN GENERAL- A Basin States Program that the Secretary, acting through the Bureau of Reclamation, shall implement to carry out salinity control activities in the Colorado River Basin using funds made available under section 205(f).

`(B) ASSISTANCE- The Secretary, in consultation with the Colorado River Basin Salinity Control Advisory Council, shall carry out this paragraph using funds described in subparagraph (A) directly or by providing grants, grant commitments, or advance funds to Federal or non-Federal entities under such terms and conditions as the Secretary may require.

`(C) ACTIVITIES- Funds described in subparagraph (A) shall be used to carry out, as determined by the Secretary--

`(i) cost-effective measures and associated works to reduce salinity from saline springs, leaking wells, irrigation sources, industrial sources, erosion of public and private land, or other sources;

`(ii) operation and maintenance of salinity control features constructed under the Colorado River Basin salinity control program; and

`(iii) studies, planning, and administration of salinity control activities.

`(D) REPORT-

`(i) IN GENERAL- Not later than 30 days before implementing the program established under this paragraph, the Secretary shall submit to the appropriate committees of Congress a planning report that describes the proposed implementation of the program.

`(ii) IMPLEMENTATION- The Secretary may not expend funds to implement the program established under this paragraph before the expiration of the 30-day period beginning on the date on which the Secretary submits the report, or any revision to the report, under clause (i).'

(b) Conforming Amendments-

(1) Section 202 of the Colorado River Basin Salinity Control Act (43 U.S.C. 1592) is amended--

(A) in subsection (a), in the matter preceding paragraph (1), by striking `program' and inserting `programs'; and

(B) in subsection (b)(4)--

(i) by striking `program' and inserting `programs'; and

(ii) by striking `and (6)' and inserting `(6), and (7).'

(2) Section 205 of the Colorado River Basin Salinity Control Act (43 U.S.C. 1595) is amended by striking subsection (f) and inserting the following new subsection:

`(f) Up-Front Cost Share-

`(1) IN GENERAL- Effective beginning on the date of enactment of this paragraph, subject to paragraph (3), the cost share obligations required by this section shall be met through an up-front cost share from the Basin Funds, in the same proportions as the cost allocations required under subsection (a), as provided in paragraph (2).

`(2) BASIN STATES PROGRAM- The Secretary shall expend the required cost share funds described in paragraph (1) through the Basin States Program for salinity control activities established under section 202(a)(7).

`(3) EXISTING SALINITY CONTROL ACTIVITIES- The cost share contribution required by this section shall continue to be met through repayment in a manner consistent with this section for all salinity control activities for which repayment was commenced prior to the date of enactment of this paragraph.'

APPENDIX B

Forum Policies

**POLICY FOR IMPLEMENTATION OF
COLORADO RIVER SALINITY STANDARDS
THROUGH THE NPDES PERMIT PROGRAM**

Adopted by
The Colorado River Basin Salinity Control Forum

February 28, 1977
Revised October 30, 2002

In November 1976, the United States Environmental Protection Agency Regional Administrators notified each of the seven Colorado River Basin states of the approval of the water quality standards for salinity for the Colorado River System as contained in the document entitled "Proposed Water Quality Standards for Salinity Including Numeric Criteria and Plan of Implementation for Salinity Control, Colorado River System, June 1975, and the supplement dated August 25, 1975. The salinity standards including numeric criteria and a plan of implementation provide for a flow weighted average annual numeric criteria for three stations in the lower main stem of the Colorado River: below Hoover Dam, below Parker Dam, and at Imperial Dam.

In 1977, the states of the Colorado River Basin adopted the "Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program." The plan of implementation is comprised of a number of Federal and non-Federal projects and measures to maintain the flow-weighted average annual salinity in the Lower Colorado River at or below numeric criteria at the three stations as the Upper and Lower Basin states continue to develop their compact-apportioned waters. One of the components of the Plan consists of the placing of effluent limitations, through the National Pollutant Discharge Elimination System (NPDES) permit program, on industrial and municipal discharges.

NPDES Policy for Municipal and Industrial Discharges of Salinity in the Colorado River

The purpose of this policy is to provide more detailed guidance in the application of salinity standards developed pursuant to Section 303 and through the NPDES permitting authority in the regulation of municipal and industrial sources. (See Section 402 of the Federal Water Pollution Control Act.) The objective of the policy, as provided in Sections I.A. and I.B., is to achieve "no salt return" whenever practicable for industrial discharges and an incremental increase in salinity over the supply water for municipal discharges. This policy is applicable to discharges that would have an impact, either direct or indirect on the lower main stem of the Colorado River System. The lower main stem is defined as that portion of the River from Hoover Dam to Imperial Dam.

In October, 2002, the Forum substantially amended the NPDES policies relating to industrial discharges but made no changes to the procedures for municipal discharges. In the printing of the 2002 Review, however, the section relating to municipal discharges and an additional appendix entitled "Guidance on New Construction Determination" were inadvertently omitted. Both errors have been corrected in this printing and the Forum reaffirms the validity of all of the policies as they appear in this document.

NPDES Policies Separately Adopted by the Forum

The Forum developed a separate and specific policy for the use of brackish and/or saline waters for industrial purposes on September 11, 1980. The Forum addressed the issue of intercepted ground water and adopted a specific policy dealing with that type of discharge on October 20, 1982. On October 28, 1988, the Forum adopted a specific policy addressing the water use and discharge associated with fish hatcheries. Each of these separately adopted policies is attached hereto.

NPDES Policies for Specified Industrial Discharges – 2002 Amendments

On October 30, 2002, the Forum amended this policy for implementation of Colorado River salinity standards through the NPDES permit program in order to address the following three additional types of industrial discharges: (1) water that has been used for once-through noncontact cooling water purposes; (2) new industrial sources that have operations and associated discharges at multiple locations; and (3) "fresh water industrial discharges" where the discharged water does not cause or contribute to exceedances of the salinity standards for the Colorado River System. This policy was also amended to encourage new industrial sources to conduct or finance one or more salinity-offset projects in cases where the permittee has demonstrated that it is not practicable to prevent the discharge of all salt from proposed new construction.

Discharges Of Once-Through Noncontact Cooling Water

Section I.C. of this policy has been added to address discharges of water that has been used for once-through noncontact cooling water purposes. The policy for such discharges shall be to permit these uses based upon a finding that the returned water does not contribute to the loading or the concentration of salts in the waters of the receiving stream beyond a *de minimis* amount. A *de minimis* amount is considered, for purposes of this policy, as an average annual increase of not more than 25 milligrams per liter (mg/L) in total dissolved solids measured at the discharge point or outfall prior to any mixing with the receiving stream in comparison to the total dissolved solids concentration measured at the intake monitoring point of the cooling process or facility. This policy is not intended to supersede any other water quality standard that applies to the receiving stream, including but not limited to narrative standards promulgated to prohibit impairment of designated uses of the stream. It is the intent of the Forum to permit the return of once-through noncontact cooling water only to the same stream from which the water was diverted. Noncontact cooling water is distinguished from blowdown water, and this policy specifically excludes blowdown or any commingling of once-through noncontact cooling water with another waste stream prior to discharge to the receiving stream. Sections I.A. and I.B. of this policy govern discharges of blowdown or commingled water.

New Industrial Sources with Operations and Discharges at Multiple Locations under Common or Affiliated Ownership or Management

Recently there has been a proliferation of new industrial sources that have operations and associated discharges at multiple locations. An example is the recent growth in the development of energy fuel and mineral resources that has occurred in the Upper Colorado River Basin. This

type of industrial development may involve the drilling of relatively closely spaced wells into one or more geological formations for the purpose of extracting oil, gas or minerals in solution. Large-scale ground water remediation efforts involving multiple pump and treat systems operating for longer than one year may share similar characteristics. With such energy and mineral development and ground water remediation efforts there is the possibility of a single major industrial operation being comprised of numerous individual point source discharges under common or affiliated ownership or management that produce significant quantities of water as a waste product or byproduct over a long period. Given the large areal scope of these types of major industrial sources and the often elevated concentrations of salinity in their produced water, the total amount of salt loading that they could generate may be very large in comparison to the Forum's past and present salt removal projects. Relatively small quantities of this produced water could generate one ton per day in discharges to surface waters. Since salinity is a conservative water quality constituent, such discharges of produced water, if uncontrolled, could have an adverse effect on achieving the adopted numeric salinity standards for the Colorado River System.

These kinds of major industrial sources strain the conventional interpretation of the industrial source waiver for new construction set forth in Section I.A.1.a. of this policy, which authorizes a discharge of salinity from a single point source of up to one ton per day in certain circumstances. The Forum adopted this provision in 1977, well before most of the new major industrial sources that have operations and discharges at multiple locations began to appear in the Colorado River Basin. A new category of industrial sources is, therefore, warranted. NPDES permit requirements for New Industrial Sources with Operations and Discharges at Multiple Locations under Common or Affiliated Ownership or Management are set forth in Section I.D. of this policy. These new requirements are intended to apply to new industrial sources with operations that commence discharging after October 30, 2002.

For purposes of interpreting this policy, "common or affiliated ownership or management" involves the authority to manage, direct, superintend, restrict, regulate, govern, administer, or oversee, or to otherwise exercise a restraining or directing influence over activities at one or more locations that result in a discharge of salinity into the Colorado River System. Common or affiliated ownership or management may be through the ownership of voting securities or may be indicated where individual sources are related through one or more joint ventures, contractual relationships, landlord/tenant or lessor/lessee arrangements. Other factors that indicate two or more discharging facilities are under common or affiliated ownership or management include: sharing corporate executive officers, pollution control equipment and responsibilities, common workforces, administrative functions, and/or payroll activities among operational facilities at different locations.

Fresh Water Industrial Discharges

Sections I.A. and I.B. of this policy have been amended to allow the permitting authority to authorize "fresh water industrial discharges" where the discharged water does not cause or contribute to exceedances of the adopted numeric salinity standards for the Colorado River System. Different end-of-pipe concentrations of salinity as shown in Table 1 of the policy, are

appropriate for discharges to tributaries depending upon their location within the Basin. The concept of "benchmark concentrations" has been developed in order to address this need for different end-of-pipe concentrations. These benchmark concentrations are not to be interpreted as water quality standards. Rather, they are intended to serve solely for the establishment of effluent limits for implementing the waiver for "fresh water discharges." The allowance for freshwater discharges is intended to preserve flows from discharges in the Basin, which do not cause significant degradation of existing ambient quality with respect to salinity. Operations or individual discharges that qualify for the freshwater waiver shall not be subject to any further limitation on salt loading under this policy.

Salinity-Offset Projects

This policy has been amended to allow the permitting authority to authorize industrial sources of salinity to conduct or finance one or more salinity-offset projects when the permittee has determined that it is not practicable: (i) to prevent the discharge of all salt from proposed new construction; (ii) to reduce the salt loading to the Colorado River to less than one ton per day or 366 tons per year; or (iii) the proposed discharge is of insufficient quality in terms of TDS concentrations that it could be considered "fresh water" as defined below. Presently, the permitting authority can consider the costs and availability of implementing off-site salinity control measures to mitigate the adverse impacts of the permitted salt load. It is not intended that the applicant be required to develop or design an off-site salinity control project or establish a salt bank, but rather to assess the costs of conducting or buying into such projects where they are available. In the future the Forum or another entity may create a trading/banking institution to facilitate the implementation of a salinity-offset program, basin-wide. This would allow industrial sources to conduct or finance the most cost effective project available at the time an offset project is needed regardless of the project's location in the Basin.

**NPDES PERMIT PROGRAM POLICY
FOR IMPLEMENTATION OF COLORADO RIVER SALINITY STANDARDS**

I. Industrial Sources

The Salinity Standards state that "The objective for discharges shall be a no-salt return policy whenever practicable." This is the policy that shall be followed in issuing NPDES discharge permits for all new industrial sources, and upon the reissuance of permits for all existing industrial sources, except as provided herein. The following addresses those cases where "no discharge of salt may be deemed not to be practicable.

A. New Construction

1. "New construction is defined as any facility from which a discharge may occur, the construction of which is commenced after October 18, 1975. (Date of submittal of water quality standards as required by 40 CFR 120, December 11, 1974.) Attachment 1 provides guidance on new construction determination. "A new industrial source with operations and discharging facilities at multiple locations under common or affiliated ownership or management shall be defined for purposes of NPDES permitting, as an industrial source that commenced construction on a pilot, development or production scale on or after October 30, 2002.

a. The permitting authority may permit the discharge of salt upon a satisfactory demonstration by the permittee that:

i. It is not practicable to prevent the discharge of all salt from the new construction or,

ii. In cases where the salt loading to the Colorado River from the new construction is less than one ton per day or 366 tons per year, or

iii. The proposed discharge from the new construction is of sufficient quality in terms of TDS concentrations that it can be considered "fresh water" that would have no adverse effect on achieving the adopted numeric standards for the Colorado River System. The permitting authority may consider a discharge to be fresh water if the maximum TDS concentration is: (i) 500 mg/L for discharges into the Colorado River and its tributaries upstream of Lees Ferry, Arizona; or, (ii) 90% of the applicable in-stream salinity standard at the appropriate benchmark monitoring station for discharges into the Colorado River downstream of Lees Ferry as shown in Table 1, below

Table 1

	Benchmark Monitoring Station	Applicable Criteria	Freshwater Discharge (mg/L)
1	Colorado River at Lees Ferry, Arizona	N/A	500
2	Colorado River below Hoover Dam	723	650
3	Colorado River below Parker Dam	747	675
4	Colorado River at Imperial Dam	879	790

- b. Unless exempted under Sections I.A.1.a.ii. or iii., above, the demonstration by the applicant must include information on the following factors relating to the potential discharge:
- (i) Description of the proposed new construction.
 - (ii) Description of the quantity and salinity of the water supply.
 - (iii) Description of water rights, including diversions and consumptive use quantities.
 - (iv) Alternative plans that could reduce or eliminate salt discharge. Alternative plans shall include:
 - (A) Description of alternative water supplies, including provisions for water reuse, if any;
 - (B) Description of quantity and quality of proposed discharge;
 - (C) Description of how salts removed from discharges shall be disposed of to prevent such salts from entering surface waters or groundwater aquifers;
 - (D) Costs of alternative plans in dollars per ton of salt removed; and

- (E) Unless the permitting authority has previously determined through prior permitting or permit renewal actions that it is not practicable to prevent the discharge of all salt from the new construction in accordance with Section I.A.1.a.i., the applicant must include information on project options that would offset all or part of the salt loading to the Colorado River associated with the proposed discharge or that would contribute to state or interstate salinity control projects or salt banking programs.
 - (v) A statement as to the one plan among the alternatives for reduction of salt discharge that is recommended by the applicant and also information as to which of the other evaluated alternatives are economically infeasible.
 - (vi) Such other information pertinent to demonstration of non- practicability as the permitting authority may deem necessary.
- c. In determining what permit conditions shall be required under I.A.1.a.i., above, the permit issuing authority shall consider, but not be limited to the following:
 - (i) The practicability of achieving no-discharge of salt from the new construction.
 - (ii) Where "no discharge" is determined not to be practicable:
 - (A) The impact of the total proposed salt discharge of each alternative on the lower main stem in terms of both tons per year and concentration.
 - (B) Costs per ton of salt removed from the discharge for each plan alternative.
 - (C) Capability of minimizing salinity discharge.
 - (D) If applicable under I.A.1.b.(iv)(E), costs and practicability of offsetting all or part of the salt load by the implementation of salt removal or salinity control projects elsewhere in the Colorado River Basin. The permittee shall evaluate the practicability of offsetting all or part of the salt load by comparing such factors as the cost per ton of salt removal for projects undertaken by the Colorado River Basin Salinity Control Forum and the costs in damages associated with increases in salinity concentration against the permittee's cost in conducting or buying into such projects where they are available.
 - (iii) With regard to subparagraphs, (b) and (c) above, the permit issuing authority shall consider the compatibility of state water laws with either

the complete elimination of a salt discharge or any plan for minimizing a salt discharge.

B. Existing Facilities or any discharging facility, the construction of which was commenced before October 18, 1975

1. The permitting authority may permit the discharge of salt upon a satisfactory demonstration by the permittee that it is not practicable to prevent the discharge of all salt from an existing facility.
2. The demonstration by the applicant must include, in addition to that required under Section I.A.1.b the following factors relating to the potential discharge:
 - a. Existing tonnage of salt discharged and volume of effluent.
 - b. Cost of modifying existing industrial plant to provide for no salt discharge.
 - c. Cost of salt minimization.
3. In determining what permit conditions shall be required, the permit issuing authority shall consider the items presented under I.A.1.c.(ii), and in addition; the annual costs of plant modification in terms of dollars per ton of salt removed for:
 - a. No salt return.
 - b. Minimizing salt return.
4. The no-salt discharge requirement may be waived in those cases where:
 - a. The discharge of salt is less than one ton per day or 366 tons per year; or
 - b. The permitting authority determines that a discharge qualifies for a "fresh water waiver" irrespective of the total daily or annual salt load. The maximum TDS concentration considered to be fresh water is 500 mg/L for discharges into the Colorado River and its tributaries upstream of Lees Ferry, Arizona. For discharges into the Colorado River downstream of Lees Ferry the maximum TDS concentration considered to be afresh water shall be 90% of the applicable in-stream standard at the appropriate benchmark monitoring station shown in Table 1, above.

C. Discharge of Once-Through Noncontact Cooling Water

1. Definitions:

- a. The terms "noncontact cooling water" and "blowdown" are defined as per 40CFR 401.11 (m) and (n).
 - b. "Noncontact cooling water" means water used for cooling that does not come into direct contact with any raw material, intermediate product, waste product or finished product.
 - c. "Blowdown" means the minimum discharge of recirculating water for the purpose of discharging materials contained in the water, the further buildup of which would cause concentration in amounts exceeding limits established by best engineering practice.
 - d. "Salinity" shall mean total dissolved solids as the sum of constituents.
2. Permits shall be authorized for discharges of water that has been used for once-through noncontact cooling purposes based upon a finding that the returned water does not contribute to the loading of salts or the concentration of salts in the waters of the receiving stream in excess of a *de minimis* amount.
 3. This policy shall not supplant nor supersede any other water quality standard of the receiving stream adopted pursuant to the Federal Clean Water Act, including but not limited to impairment of designated uses of the stream as established by the governing water quality authority having jurisdiction over the waters of the receiving stream.
 4. Noncontact cooling water shall be distinguished from blowdown, and Section 1.C. of this policy specifically excludes blowdown or any commingling of once-through noncontact cooling water with another waste stream prior to discharge to the receiving stream. Sections I.A. and I.B of this policy shall in all cases govern discharge of blowdown or commingled water.
 5. Once-through noncontact cooling water shall be permitted to return only to the same stream from which the water was diverted.
 6. Because the increase in temperature of the cooling water will result in some evaporation, a *de minimis* increase in the concentration of dissolved salts in the receiving water may occur. An annual average increase in total dissolved solids of not more than 25 milligrams per liter (mg/L) measured at the intake monitoring point, as defined below, of the cooling process or facility, subtracted from the effluent total dissolved solids immediately upstream of the discharge point to the receiving stream, shall be considered *de minimis*.
 7. At the time of NPDES discharge permit issuance or reissuance, the permitting authority may permit a discharge in excess of the 25 mg/L increase based upon a satisfactory demonstration by the permittee pursuant to Section 1.A.1.a.

8. Once-through demonstration data requirements:
 - a. Description of the facility and the cooling process component of the facility.
 - b. Description of the quantity, salinity concentration and salt load of intake water sources.
 - c. Description of the discharge, covering location, receiving waters, quantity of salt load and salinity concentration of both the receiving waters and the discharge.
 - d. Alternative plans for minimizing salt discharge from the facility which shall include:
 - (i) Description of alternative means to attain no discharge of salt.
 - (ii) Cost of alternative plans in dollars per ton of salt removed from discharge.
 - (iii) Such other information pertinent to demonstration of non- practicability as the permitting authority may deem necessary.
9. If, in the opinion of the permitting authority, the database for the salinity characteristics of the water source and the discharge is inadequate, the permit will require that the permittee monitor the water supply and the discharge for salinity. Such monitoring program shall be completed in two years and the permittee shall then present the once-through demonstration data as specified above.
10. All new and reissued NPDES permits for once-through noncontact cooling water discharges shall require at a minimum semiannual monitoring of the salinity of the intake water supply and the effluent, as provided below.
 - a. The intake monitoring point shall be the point immediately before the point of use of the water.
 - b. The effluent monitoring point shall be prior to the discharge point at the receiving stream or prior to commingling with another waste stream or discharge source.
 - c. Discrete or composite samples may be required at the discretion of the permitting authority, depending on the relative uniformity of the salinity of the water supply.
 - d. Analysis for salinity may be either total dissolved solids or electrical conductivity where a satisfactory correlation with total dissolved solids has been established. The correlation shall be based on a minimum of five different samples.

D. Discharges of Salinity from a New Industrial Source with Operations and Discharging Facilities at Multiple Locations

1. The objective for discharges to surface waters from a new industrial source with operations and discharging facilities at multiple locations shall be to assure that such operations will have no adverse effect on achieving the adopted numeric salinity standards for the Colorado River System.
2. NPDES permit requirements for a new industrial source with operations and discharging facilities at multiple locations shall be defined, for purposes of establishing effluent limitations for salinity, as a single industrial source if these facilities meet the criteria:
 - a. The discharging facilities are interrelated or integrated in any way including being engaged in a primary activity or the production of a principle product; and
 - b. The discharging facilities are located on contiguous or adjacent properties or are within a single production area e.g. geologic basin, geohydrologic basin, coal or gas field or 8 digit hydrologic unit watershed area; and
 - c. The discharging facilities are owned or operated by the same person or by persons under common or affiliated ownership or management.
3. The permitting authority may permit the discharge of salt from a new industrial source with operations and discharging facilities at multiple locations if one or more of the following requirements are met:
 - a. The permittee has demonstrated that it is not practicable to prevent the discharge of all salt from the industrial source. This demonstration by the applicant must include detailed information on the factors set forth in Section I.A.1.b of the Policy for implementation of Colorado River Salinity Standards through the NPDES permit program; with particular emphasis on an assessment of salinity off-set options that would contribute to state or interstate salinity control projects or salt banking programs and offset all or part of the salt loading to the Colorado River associated with the proposed discharge.
 - b. In determining what permit conditions shall be required under I.A.1.a.i., above, the permit issuing authority shall consider the requirement for an offset project to be feasible if the cost per ton of salt removal in the offset project options (i.e. the permittee's cost in conducting or buying into such projects where they are available) is less than or equal to the cost per ton of salt removal for projects undertaken by the Colorado River Basin Salinity Control Forum or less than the cost per ton in damages caused by salinity that would otherwise be cumulatively discharged from the outfalls at the various locations with operations controlled by the industrial source; or
 - c. The permittee has demonstrated that one or more of the proposed discharges is of sufficient quality in terms of TDS concentrations to qualify for a "fresh water

waiver" from the policy of "no salt return, whenever practical. An individual discharge that can qualify for a fresh water waiver shall be considered to have no adverse effect on achieving the adopted numeric salinity standards for the Colorado River System.

4. For the purpose of determining whether a freshwater waiver can be granted, the quality of water discharged from the new industrial source with operations and discharging facilities at multiple locations, determined as the flow weighted average of salinity measurements at all outfall points, must meet the applicable benchmark concentration in accordance with Section I.A.1.a.iii., as set forth above.
5. Very small-scale pilot activities, involving 5 or fewer outfalls, that are sited in areas not previously developed or placed into production by a new industrial source operations and discharges at multiple locations under common or affiliated ownership or management, may be permitted in cases where the discharge of salt from each outfall is less than one ton per day or 366 tons per year. However, no later than the date of the first permit renewal after the pilot activities have become part of a larger industrial development or production scale effort, all discharging facilities shall be addressed for permitting purposes as a single industrial source with operations and discharges at multiple locations under common or affiliated ownership or management.
6. The public notice for NPDES permits authorizing discharges from operations at multiple locations with associated outfalls shall be provided promptly and in the most efficient manner to all member states in the Colorado River Basin Salinity Control Forum in relation to this policy.

II. Municipal Discharges

The basic policy is that a reasonable increase in salinity shall be established for municipal discharges to any portion of the Colorado River stream system that has an impact on the lower main stem. The incremental increase in salinity shall be 400 mg/L or less, which is considered to be a reasonable incremental increase above the flow weighted average salinity of the intake water supply.

- A. The permitting authority may permit a discharge in excess of the 400 mg/L incremental increase at the time of issuance or reissuance of a NPDES discharge permit, upon satisfactory demonstration by the permittee that it is not practicable to attain the 400 mg/L limit.
- B. Demonstration by the applicant must include information on the following factors relating to the potential discharge:
 1. Description of the municipal entity and facilities.
 2. Description of the quantity and salinity of intake water sources.

3. Description of significant salt sources of the municipal wastewater collection system, and identification of entities responsible for each source, if available.
 4. Description of water rights, including diversions and consumptive use quantities.
 5. Description of the wastewater discharge, covering location, receiving waters, quantity, salt load, and salinity.
 6. Alternative plans for minimizing salt contribution from the municipal discharge. Alternative plans should include:
 - a. Description of system salt sources and alternative means of control.
 - b. Cost of alternative plans in dollars per ton, of salt removed from discharge.
 7. Such other information pertinent to demonstration of non-practicability as the permitting authority may deem necessary.
- C. In determining what permit conditions shall be required, the permit issuing authority shall consider the following criteria including, but not limited to:
1. The practicability of achieving the 400 mg/L incremental increase.
 2. Where the 400 mg/L incremental increase is not determined to be practicable:
 - a. The impact of the proposed salt input of each alternative on the lower main stem in terms of tons per year and concentration.
 - b. Costs per ton of salt removed from discharge of each alternative plan.
 - c. Capability of minimizing the salt discharge.
- D. If, in the opinion of the permitting authority, the data base for the municipal waste discharger is inadequate, the permit will contain the requirement that the municipal waste discharger monitor the water supply and the wastewater discharge for salinity. Such monitoring program shall be completed within 2 years and the discharger shall then present the information as specified above.
- E. Requirements for establishing incremental increases may be waived in those cases where the incremental salt load reaching the main stem of the Colorado River is less than one ton per day or 366 tons per year. Evaluation will be made on a case-by-case basis.

- F. All new and reissued NPDES permits for all municipalities shall require monitoring of the salinity of the intake water supply and the wastewater treatment plant effluent in accordance with the following guidelines:

<u>Treatment Plant Design Capacity</u>	<u>Monitoring Frequency</u>	<u>Type of Sample</u>
<1.0 MGD*	Quarterly	Discrete
1.0 - 5.0 MGD	Monthly	Composite
>5.0 - 50.0 MGD	Weekly	Composite
50.0 MGD	Daily	Composite

1. Analysis for salinity may be either as total dissolved solids (TDS) or be electrical conductivity where a satisfactory correlation with TDS has been established. The correlation should be based on a minimum of five different samples.
2. Monitoring of the intake water supply may be at a reduced frequency where the salinity of the water supply is relatively uniform.

Attachment 1

Guidance on New Construction Determination

For purposes of determining a new construction, a source should be considered new if by October 18, 1975, there has not been:

- I. Significant site preparation work such as major clearing or excavation; and/or
- II. Placement, assembly or installation of unique facilities or equipment at the premises where such facilities or equipment will be used; and/or
- III. Any contractual obligation to purchase unique facilities or equipment. Facilities and equipment shall include only the major items listed below, provided that the value of such items represents a substantial commitment to construct the facility:
 - A. structures; or
 - B. structural materials; or
 - C. machinery; or
 - D. process equipment; or
 - E. construction equipment.
- IV. Contractual obligation with a firm to design, engineer, and erect a completed facility (i.e., a turnkey plant).

**POLICY FOR USE OF
BRACKISH AND/OR SALINE WATERS
FOR INDUSTRIAL PURPOSES**

Adopted by
The Colorado River Basin Salinity Control Forum

September 11, 1980

The states of the Colorado River Basin, the federal Executive Department, and the Congress have all adopted as a policy that the salinity in the lower main stem of the Colorado River shall be maintained at or below the flow-weighted average values found during 1972, while the Basin states continue to develop their compact-apportioned waters. In order to achieve this policy, all steps which are practical and within the framework of the administration of states' water rights must be taken to reduce the salt load of the river. One such step was the adoption in 1975 by the Forum of a policy regarding effluent limitations for industrial discharges with the objective of no-salt return wherever practicable. Another step was the Forum's adoption in 1977 of the Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program. These policies are part of the basinwide plan of implementation for salinity control which has been adopted by the seven Basin states.

The Forum finds that the objective of maintaining 1972 salinity levels would be served by the exercise of all feasible measures including, wherever practicable, the use of brackish and/or saline waters for industrial purposes.

The summary and page 32 of the Forum's 1978 Revision of the Water Quality Standards for Salinity state: The plan also contemplates the use of saline water for industrial purposes whenever practicable,... In order to implement this concept and thereby further extend the Forum's basic salinity policies, the Colorado River Basin states support the Water and Power Resources Service (WPRS) appraisal study of saline water collection, pretreatment and potential industrial use.

The Colorado River Basin contains large energy resources which are in the early stages of development. The WPRS study should investigate the technical and financial feasibility of serving a significant portion of the water requirements of the energy industry and any other industries by the use of Basin brackish and/or saline waters. The Forum recommends that:

- I. The Colorado River Basin states, working with federal agencies, identify, locate and quantify such brackish and/or saline water sources.
- II. Information on the availability of these waters be made available to all potential users.
- III. Each state encourage and promote the use of such brackish and/or saline waters, except where it would not be environmentally sound or economically feasible, or would significantly increase

consumptive use of Colorado River System water in the state above that which would otherwise occur.

- IV. The WPRS, with the assistance of the states, encourages and promotes the use of brackish return flows from federal irrigation projects in lieu of fresh water sources, except where it would not be environmentally sound or economically feasible, or would significantly increase consumptive use of Colorado River System water.
- V. The WPRS considers a federal contribution to the costs of industrial use of brackish and/or saline water, where cost-effective, as a joint private-government salinity control measure. Such activities shall not delay the implementation of the salinity control projects identified in Title II of P.L. 93-320.

**POLICY FOR IMPLEMENTATION OF
COLORADO RIVER SALINITY STANDARDS
THROUGH THE NPDES PERMIT PROGRAM
FOR INTERCEPTED GROUND WATER**

Adopted by
The Colorado River Basin Salinity Control Forum

October 20, 1982

The States of the Colorado River Basin in 1977 agreed to the Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program with the objective for industrial discharge being no-salt return whenever practicable. That policy required the submittal of information by the applicant on alternatives, water rights, quantity, quality, and costs to eliminate or minimize the salt discharge. The information is for use by the NPDES permit-issuing agency in evaluating the practicability of achieving no-salt discharge.

There are mines and wells in the Basin which discharge intercepted ground waters. The factors involved in those situations differ somewhat from those encountered in other industrial discharges. Continued development will undoubtedly result in additional instances in which permit conditions must deal with intercepted ground water.

The discharge of ¹intercepted ground water needs to be evaluated in a manner consistent with the overall objective of no-salt return whenever practical. The following provides more detailed guidance for those situations where ground waters are intercepted with resultant changes in ground-water flow regime.

- I. The no-salt discharge requirement may be waived at the option of the permitting authority in those cases where the discharged salt load reaching the main stem of the Colorado River is less than one ton per day or 366 tons per year. Evaluation will be made on a case-by-case basis.
- II. Consideration should be given to the possibility that the ground water, if not intercepted, normally would reach the Colorado River System in a reasonable time frame. An industry desiring such consideration must provide detailed information including a description of the topography, geology, and hydrology. Such information must include direction and rate of ground-water flow; chemical quality and quantity of ground water; and the location, quality, and quantity of surface streams and springs that might be affected. If the information adequately demonstrates that the ground water to be intercepted normally would reach the river system in a reasonable time frame and would contain approximately the same or greater salt load than if intercepted, and if no significant localized problems would be created, then the permitting agency may waive the no-salt discharge requirement.

¹The term intercepted ground water means all ground water encountered during mining or other industrial operations.

- III. In those situations where the discharge does not meet the criteria in I or II above, the applicant will be required to submit the following information for consideration:
- A. Description of the topography, geology, and hydrology. Such information must include the location of the development, direction and rate of ground-water flow, chemical quality and quantity of ground water, and relevant data on surface streams and springs that are or might be affected. This information should be provided for the conditions with and without the project.
 - B. Alternative plans that could substantially reduce or eliminate salt discharge. Alternative plans must include:
 - 1. Description of water rights, including beneficial uses, diversions, and consumptive use quantities.
 - 2. Description of alternative water supplies, including provisions for water reuse, if any.
 - 3. Description of quantity and quality of proposed discharge.
 - 4. Description of how salts removed from discharges shall be disposed of to prevent their entering surface waters or ground-water aquifers.
 - 5. Technical feasibility of the alternatives.
 - 6. Total construction, operation, and maintenance costs; and costs in dollars per ton of salt removed from the discharge.
 - 7. Closure plans to ensure termination of any proposed discharge at the end of the economic life of the project.
 - 8. A statement as to the one alternative plan for reduction of salt discharge that the applicant recommends be adopted, including an evaluation of the technical, economic, and legal Practicability of achieving no discharge of salt.
 - 9. Such information as the permitting authority may deem necessary.
- IV. In determining whether a no-salt discharge is Practicable, the Permit-issuing authority shall consider, but not be limited to, the water rights and the technical, economic, and legal practicability of achieving no discharge of salt.
- V. Where no-salt discharge is determined not to be Practicable the permitting authority shall, in determining permit conditions, consider:

- A. The impact of the total proposed salt discharge of each alternative on the lower main stem in terms of both tons per year and concentration.
- B. Costs per ton of salt removed from the discharge for each plan alternative.
- C. The compatibility of state water laws with each alternative.
- D. Capability of minimizing salinity discharge.
- E. The localized impact of the discharge.
- F. Minimization of salt discharges and the preservation of fresh water by using intercepted ground water for industrial processes, dust control, etc. whenever it is economically feasible and environmentally sound.

**POLICY FOR IMPLEMENTATION OF
COLORADO RIVER SALINITY STANDARDS
THROUGH THE NPDES PERMIT PROGRAM
FOR FISH HATCHERIES**

Adopted by
The Colorado River Basin Salinity Control Forum

October 28, 1988

The states of the Colorado River Basin in 1977 adopted the Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program. The objective was for no-salt return whenever practicable for industrial discharges and an incremental increase in salinity over the supply water for municipal discharges. The Forum addressed the issue of intercepted ground water under the 1977 policy, and adopted a specific policy dealing with that type of discharge.

A specific water use and associated discharge which has not been here-to-fore considered is discharges from fish hatcheries. This policy is limited exclusively to discharges from fish hatcheries within the Colorado River Basin. The discharges from fish hatcheries need to be addressed in a manner consistent with the 1977 and 1980 Forum policies.

The basic policy for discharges from fish hatcheries shall permit an incremental increase in salinity of 100 mg/L or less above the flow weighted average salinity of the intake supply water. The 100 mg/L incremental increase may be waived if the discharged salt load reaching the Colorado River system is less than one ton per day, or 366 tons per year. Evaluation is to be made on a case-by-case basis.

- I. The permitting authority may permit a discharge in excess of the 100 mg/L incremental increase at the time of issuance or reissuance of a NPDES discharge permit. Upon satisfactory demonstration by the permittee that it is not practicable to attain the 100 mg/L limit.
- II. Demonstration by the applicant must include information on the following factors relating to the potential discharge:
 - A. Description of the fish hatchery and facilities.
 - B. Description of the quantity and salinity of intake water sources.
 - C. Description of salt sources in the hatchery.
 - D. Description of water rights, including diversions and consumptive use quantities.
 - E. Description of the discharge, covering location, receiving waters, quantity salt load, and salinity.

- F. Alternative plans for minimizing salt discharge from the hatchery. Alternative plans should include:
 - 1. Description of alternative means of salt control.
 - 2. Cost of alternative plans in dollars per ton, of salt removed from discharge.
 - G. Such other information pertinent to demonstration of non-practicability as the permitting authority may deem necessary.
- III. In determining what permit conditions shall be required, the permit-issuing authority shall consider the following criteria including, but not limited to:
- A. The practicability of achieving the 100 mg/L incremental increase.
 - B. Where the 100 mg/L incremental increase is not determined to be practicable:
 - 1. The impact of the proposed salt input of each alternative on the lower main stem in terms of tons per year and concentration.
 - 2. Costs per ton of salt removed from discharge of each alternative plan.
 - 3. Capability of minimizing the salt discharge.
- IV. If, in the opinion of the permitting authority, the database for the hatchery is inadequate, the permit will contain the requirement that the discharger monitor the water supply and the discharge for salinity. Such monitoring program shall be completed within two years and the discharger shall then present the information as specified above.
- V. All new and reissued NPDES permits for all hatcheries shall require monitoring of the salinity of the intake water supply and the effluent at the time of peak fish population.
- A. Analysis for salinity may be either as total dissolved solids (TDS) or be electrical conductivity where a satisfactory correlation with TDS has been established. The correlation should be based on a minimum of five different samples

APPENDIX C

States List of NPDES Permits

LEGEND

**NPDES PERMITS
EXPLANATION CODES**

COLORADO RIVER BASIN SALINITY CONTROL FORUM
Through December 31, 2007

NPDES permits are reviewed under two different criterium under Forum policy; these being municipal and industrial. In order for a permittee to be in compliance under the municipal criterium, the increase in concentration between inflow and outflow can not be greater than 400 mg/L. Forum industrial criterium requires that no industrial user discharges more than 1.00 ton/day. Under Forum policy there can be granted exceptions to these limitations by the states. The following gives an explanation of the current status of the NPDES permits. Because at any given time many of the approximate 600 permits identified in this list are being reviewed, reissued, and/or terminated, and new discharge permits are being filed, this list must be considered as being subject to frequent change.

MUNICIPAL

INDUSTRIAL

(M)	Municipal user in compliance with Forum policy.	(I)	Industrial user in compliance with Forum policy.
(M-1)	Permit has expired or been revoked. No discharge.	(I-1)	Permit has expired or been revoked. No discharge.
(M-2)	Permittee did not discharge during the reporting period.	(I-2)	Permittee did not discharge during the reporting period.
(M-3)	Measurement of TDS is not currently required, but the state and/or EPA plans to require measurements of both inflow and outflow when the permit is reissued.	(I-3)	Measurement of TDS is not currently required, but the state and/or EPA plans to require measurements of both volume and concentration of outflow when the permit is reissued.
	Measurements of inflow are not consistent with Forum policy;	(I-4)	Either concentration or volume of outflow are not currently being reported, thus the permittee is in violation of Forum policy. It is not known if the discharge is in excess of the <1.00 ton/day requirement.
(M-4A)	Therefore, it is not known whether or not this municipal user is in compliance.		
(M-4B)	However, since outflow concentration is less than 500 mg/L it is presumed that this permit is not in violation of the ≤ 400 mg/L increase.		Permittee appears to be in violation of Forum policy in that discharge of salts is >1.00 ton/day.
(M-5)	Permittee is in violation of Forum policy in that there is an increase in concentration of >400 mg/L over the source waters.	(I-5A)	No provision has been made allowing this violation of Forum policy.
(M-5A)	The state is currently working to bring permittee into compliance.	(I-5B)	Though discharge is >1.00 ton/day, in keeping with Forum policy the permittee has demonstrated the salt reduction is not practicable and the requirement has been waived.
(M-6)	This permit requires no discharge or discharge only under rare and extreme hydrologic conditions. Thus, flow and concentration measurements are not required.	(I-5C)	The use of ground water under this permit is for geothermal energy and only heat is extracted. The intercepted salt and water are naturally tributary to the Colorado River System and hence, this discharge does not increase salt in the river. The permit is covered by the Forum's policy on intercepted ground waters.
(M-7)	Insufficient data to know the status of this permit.	(I-5D)	This permit is in compliance with the Forum's policy for fish hatcheries. The use of the water is a one-time pass through, and the incremental increase in salinity is ≤ 100 mg/l.
		(I-5E)	This permit is for the interception and passage of ground waters and thus is excepted under the Forum's policy on intercepted ground waters .
		(I-6)	This permit requires no discharge or discharge only under rare and extreme hydrologic conditions. Thus, flow and concentration measurements are not required.
*	Permits shown for New Mexico are prepared by the state's environmental department and then issued by USEPA.	(I-7)	Insufficient data to know the current status of this permit.

LEGEND (continued)
NPDES PERMITS
REACH DEMARCATIONS

COLORADO RIVER BASIN SALINITY CONTROL FORUM

In order to provide a better understanding of the location of the various NPDES permits and the geographical sequence in the Colorado River System, each of the following NPDES permits is identified with a Colorado River reach number. The reach numbers have their origin in the old CRSS river model. Though this model is no longer used, the reach numbers assist in understanding the general location of the permits. The reaches are defined as:

100	Upper Main Stem	from headwaters of Colorado River to Colorado River near Cameo
190	Taylor Park	from headwaters of Gunnison River to above Blue Mesa Reservoir
200	Blue Mesa	from above Blue Mesa Reservoir to below Blue Mesa Dam
210	Morrow Point	from below Blue Mesa Dam to Crystal Reservoir
220	Lower Gunnison	from Crystal Reservoir to confluence with Colorado River
300	Grand Valley	from Colorado River near Cameo to confluence with Green River
310	Dolores River	from headwaters of Dolores River to confluence with Colorado River
401	Fontenelle	from headwaters of Green River to Green River near Green River, WY
411	Flaming Gorge	from Green River near Green River, WY to confluence with White and Duchesne Rivers
500	Yampa River	from headwaters of Yampa River to confluence with Green River
510	White River	from headwaters of White River to confluence with Green River
600	Green River	Green River from confluence with White and Duchesne Rivers to confluence with Colorado River
610	Duchesne River	from headwaters of Duchesne River to confluence with Green River
700	Lake Powell	Colorado River from confluence of with Green River to Lees Ferry
710	San Rafael River	from headwaters of San Rafael River to confluence with Green River
801	Upper San Juan River	from headwaters of San Juan River to San Juan near Bluff
802	Lower San Juan River	from San Juan near Bluff to confluence with Lake Powell
900	Glen Canyon to Lake Mead	Colorado River from Lees Ferry to backwaters of Lake Mead
905	Virgin River	from headwaters of Virgin River to backwaters of Lake Mead
910	Lake Mead	from backwaters of Lake Mead to Colorado River below Hoover Dam
920	Lake Mohave	Colorado River from below Hoover Dam down to I-40 bridge
930	Lake Havasu	Colorado River from I-40 bridge to below Parker Dam
940	Parker Dam to Imperial Dam	Colorado River from below Parker Dam to above Imperial Dam
945	Imperial Dam	Colorado River from above Imperial Dam to Gila and Yuma users

NPDES PERMITS
Colorado River Basin Salinity Control Forum
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NPDES #	REACH	NAME	CONCENTRATION	FLOW RATE	SALT LOAD	EXPLANATION
			MG/L	MGD	TONS/DAY	CODE
AZ0023311	900	APS/CHOLLA POWER PLANT		273.6		I-6
AZ0025399	900	BISON RANCH		0.04		M-6
AZ0023507	930	BLAKE RANCH RVP		0.003		M-1
AZ0023035	930	BLUE BEACON OF KINGMAN		0.03		I-3
AZ0024015	900	CANYON-VALLE AIRPORT		0.045		M-3
AZ0023990	930	CAWCD-HAVASU PLUMBING PLANT		1.5		I
AZ0021024	920	CITIZENS UTILITIES - RIVERBEND		0		M-1
AZ0022268	930	CYPRUS BAGDAD COPPER DIV		0		I-6
AZ0022322	900	ENERGY FUELS NUCLEAR KANAB		0		I-1
AZ0022187	920	HARRISON MINING/TYRO MINE		0		I-1
AZ0024279	900	HIGH COUNTRY PINES		0.036		M-6
AZ0020257	900	HOLBROOK, CITY OF		1.3		M-3
AZ0022489	930	KINGMAN/DOGTOWN	75	0.52	0.16	M
AZ0022918	900	LAKE INVESTMENTS % LIVECO		0		M-1
AZ0022098	940	LE PERA SCHOOL - PARKER S. D. #27		0		M-1
AZ0023647	930	MOHAVE TOPOCK COMPRESSOR STATION	1300	0.202	1.10	I-1
AZ0022284	940	PARKER, TOWN OF WTP		0.013		M-1
AZ0022756	930	PETRO STOP CENTER/KINGMAN		0.008		I-3
AZ0024406	930	PLANET TRUCK WASH		0.007		I-1
AZ0023752	940	QUARTSZITE, CITY OF WWTF	<400	0.45		M
AZ0022772	900	ST. JOHNS, CITY OF POTW		0.5		M-3
AZ0024422	900	SANDERS SCHOOL DISTRICT NO. 6	<400	0.04		M
AZ0023698	905	SENITA VILLAGE RV RESORT		0		M-1
AZ0023841	900	SHOW LOW, CITY OF	<400	1.42		M
AZ0024287	900	SNOWFLAKE, CITY OF	<400	0.6		M
AZ0023477	900	SOUTH GRAND CANYON S.D.	<400	0.75		M
AZ0021474	900	STONE FOREST INDUSTRIES/FLAGSTAFF		0		I-1
AZ0110248	920	USBR/DAVIS DAM		0.027		I-7
AZ0110019	900	USBR/GLEN CANYON CRSP	350	0.015	0.02	M
AZ025160	910	USBR/HOOVER DAM	150	0.045	0.03	M
AZ0023612	900	USNPS/GRAND CANYON/ DESERT VIEW	<400	0.04		M
AZ0110426	900	USNPS/GRAND CANYON/NORTH RIM		0.15		M-3
AZ0023621	900	USNPS/GRAND CANYON/INDIAN GARDENS	<100	1.008		I
AZ0022152	900	USNPS/GRAND CANYON/SOUTH RIM	<400	0.75		M
AZ0023523	920	USNPS/KATHERINE'S LANDING WTP	<100	0.2		M
AZ0023655	905	VIRGIN RIVER DOMESTIC WATER IMP DISTRICT	<400	0.04		M
AZ0024356	900	WILLIAMS, CITY OF WWTP		0.54		M-3
AZ0024356	900	WILLIAMS WTP		0.033		M-1
AZ0023833	900	WINSLOW, CITY OF POTW	<400	2.2		M
AZ0020427	900	Flagstaff Wildcat	<400			M
AZ0023639	900	Flagstaff Rio de Flag	<400			M
AZ0025542	900	Holbrook- Painted Mesa				M-7
AZ0025437	900	Pinetop Lakeside				M-7
AZ0025666	900	Glen Canyon Sumps				I-3
CA7000016	940	PG&E TOPOCK	500	0.030	0.00	I-2
CA7000005	940	USBR, PARKER DAM AND POWER PLANT DWF	560	0.009	0.02	M

At the time of this publication, Colorado was still updating its list. For copies of the current list, contact Steve Miller at (303) 866-3441 ext 3228.

NPDES PERMITS
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NPDES #	REACH	NAME	CONCENTRATION	FLOW RATE	SALT LOAD	EXPLANATION
			MG/L	MGD	TONS/DAY	CODE
NV0021261	910	CCSD AWT Plant 1	1230.0	46.330	237.63	M-5A
NV0021563	920	CCSD Laughlin	417.0	2.180	3.79	M-6*
NV0022837	910	Circle K Stores Inc	ND	ND		I-5E
NV0022730	910	D&G Oil	Cancelled			I-5E
NV0022721	910	Exxon #7-3868	Inactive			I-5E
NV0022845	910	Harrah's Las Vegas	ND	ND		I
NV0022098	910	Henderson WRF	1300.0	15.800	85.65	M-5A
NV0021750	910	Hilton Hotel & Casino	1740.0	0.026	0.19	I-5E
NV0023060	910	Kerr McGee	6348.0	1.420	37.59	I
NV0000078	910	Kerr McGee (001a)	370.0	0.620	0.96	I
NV0000078	910	Kerr McGee (001b)	790.0	0.344	1.13	I
NV0000078	910	Kerr McGee (002a)	100.0	0.001	0.00	I
NV0000078	910	Kerr McGee (002b)	2743.0	0.432	4.94	I
NV0000078	910	Kerr McGee (003b)	0.0	0.000	0.00	I-2
NV0022691	910	Lake Las Vegas	ND	ND		I
NV0020133	910	Las Vegas WWTP	691.0	63.640	183.38	M-5A
NV0022748	910	Las Vegas, City of (Bonneville)	1460.0	0.016	0.09	I-5E
NV0022250	910	Lowes HIW, Inc.	Inactive			I-5E
NV0021950	910	LV-Municipal Strom Drain Syst.			0.00	M-5A
NV0022641	910	Marnell Carrao for Bellagio	Inactive			I-2
NV0020192	910	NDOW - Lade Mead	ND	ND		I-5D
NV0020923	910	Pioneer Chlor Alkali #7	ND	ND		I-2
NV0022446	910	Rebel Oil Company	Inactive			I-2
NV0022896	910	Red Rock Mini Mart	Inactive			I-2
NV0022594	910	Secor/7-eleven #13702	Inactive			I-5E
NV0022608	910	Secor/7-eleven #29643	Inactive			I-5E
NV0022772	910	Signature Homes	5480.0	0.296	6.76	I-7
NV0022802	910	Southland Corp - #20084	Inactive			I-5E
NV0022829	910	Southland Corp - #20084	Inactive			I-5E
NV0022811	910	Southland Corp - #20084	Inactive			I-5E
NV0022870	910	Southland Corp - #20084		0.002	0.00	I-5E
NV0021679	910	Stallion Mountain Country Club	5700.0		0.00	I-5B/E
NV0000060	910	Titanium Metals (TIMET)	698.0	3.000	8.73	I
NV0022781	910	Tomiyasu Basement Dewatering	3500.0	0.068	0.99	I-5E
NV0022420	910	Union Oil Company	ND	ND		I-5E
NV0021865	910	US NPS - Callville Bay	Cancelled			M
NV0021873	910	US NPS - Echo Bay WTP	Cancelled			M
NV0021881	910	US NPS - Las Vegas Bay WTP	Inactive			M
NV0021890	910	US NPS - Overton Beach	Cancelled			M
NV0022543	910	USA #100	Inactive			I-5E
NV0022195	910	Valley Hospital	992.0	0.005	0.02	I-5E
NV0022888	910	Venetian, The	744.0	0.015	0.05	I-5E
NM0030317	801	Blanco MDWA (WTP)				
NM0028142	801	Bloomfield Municipal Schools	705	0.002	0.01	I*
NM0030902	801	Bloomfield Water	296	0.224	0.00	I*
NM0029319	801	Central Consolidated School District	730	0.050	0.15	I*
NM0020168	801	City of Aztec WWTP	520	1.000	2.17	M*
NM0028762	801	City of Aztec WTP				I-7
NM0020770	801	City of Bloomfield	306	0.800	1.00	M*

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NPDES #	REACH	NAME	CONCENTRATION	FLOW RATE	SALT LOAD	EXPLANATION
			MG/L	MGD	TONS/DAY	CODE
NM0000043	801	City of Farmington, Animas Steam Plant	-	-	-	I*
NM0023396	900	Ramah Water & Sanitation Dist.	-	0.058	-	M-7*
NM0030520	801	Dulce, Village of/ WWTP	-	0.600	-	M7
NM0000051	801	Farmington Drinking Water	n/a	n/a	n/a	I-1*
NM0029572	801	Farmington Municipal Op.	n/a	n/a	n/a	I-1*
NM0028258	801	Farmington Sand & Gravel Co.	-	-	-	I-2*
NM0020583	801	Farmington WWTP	452	6.670	13.00	M5A*
NM0027995	801	Oldcastle SW Group, Inc.	-	0.700	1.50	I-7*
NM0020672	900	Gallup WWTP	275	3.500	4.00	M*
NM0029025	801	Harper Valley Subd.	300	0.069	0.12	IM*
NM0030953	801	Navajo Dam DWC & NSW, Inc	-	0.004	-	I-2*
NM0028606	801	Public Service Co of NM - San Juan	-	-	-	I-2*
NM0020524	900	QUIVIRA MINING COMPANY - CHURCH ROCK	0	0.000	0.00	I-1*
NM0029505	801	San Juan Coal Co. - La Plata	-	-	-	I-2*
NM0028746	801	San Juan Coal Company - San Juan	-	-	-	I-2*
NM0000027	801	San Juan Concrete Co.	n/a	n/a	n/a	I-1*
NM0030473	801	San Juan County McGee Park WWTP	285	0.050	0.06	M
NM0020401	900	United Nuclear Corp.	n/a	n/a	n/a	I-1*
NM0028550	900	United Nuclear Corp.	n/a	n/a	n/a	I-1*
NM0029432	801	Yampa Mining Co. (De-na-zin Mine)	-	-	-	I-2*
NM0029475	801	Yampa Mining Co. (Gatew.)	-	-	-	I-2*
UT0021091	610	Altamont, City of	-	-	-	M-1
UTG040007	600	Andalex Wildcat Loadout	0	0.000	0.00	I
UT0025674	600	Andalex-Pinnacle Coal Mine	1585	1.100	7.27	I
UTG040008	600	Andalex-Pinnacle Coal Mine	2123	0.440	3.90	I-1
UT0025453	600	Ark Land Co.	-	-	-	I-1
UTG640027	411	Ashely Valley WTP	0	0.000	0.00	M-6
UTG640003	411	Ashley Springs WTP	0	0.000	0.00	M-6
UT0024511	411	Ashley Valley Sewer Board	-	-	-	M-1
UT0025348	411	Ashley Valley Water & Sewer, Mechanical	490	4.100	8.37	M
UTG640019	802	Blanding Culinary Water Treatment	0	0.000	0.00	M-6
UT0025500	905	Blue Bunny Ice Cream	-	-	-	I-1
UTG040011	600	Canyon Fuel Co.- Banning Loadout	0	0.000	0.00	I-2
UT0024759	600	Canyon Fuel Co.- Dugout Mine	1280	1.000	5.30	I
UTG040020	600	Canyon Fuel Co.- Dugout Mine	-	-	-	I-1
UT0023540	600	Canyon Fuel Co.- Skyline Mine	650	6.100	16.50	I
UT0022918	700	Canyon Fuel Co.- SUFCo Mine	687	3.750	10.75	I-5E
UT0023680	600	Canyon Fuel Co.-Soldier Creek Coal	0	0.000	0.00	I-2
UT0023663	710	Castle Valley SSD-Castle Dale	1535	0.100	0.64	M
UT0020052	710	Castle Valley SSD-Ferron	967	0.180	0.73	M
UT0021296	710	Castle Valley SSD-Huntington	1900	0.240	1.90	M-5A
UTG790017	610	Chevron-Myton Pumping Station (Earthfax Eng.)	-	-	-	I-1
UTG040026	700	Consolidated Coal Co.-Hidden Valley Mine Site	1010	0.120	0.51	I
UT0022616	700	Consolidated Coal Co.-Underground	3309	0.775	6.73	I-5E
UTG040006	700	CO-OP Mining Co.	0	0.000	0.00	I-2
UTG040016	600	Cypres Blackhawk	-	-	-	I-1
UT0023736	600	Cyprus Plateau Mining Co.(Star Point Mine)	0	0.000	0.00	I-1
UT0020095	610	Duchesne City Corp.	1275	0.390	2.10	M
UTG640028	610	Duchesne Cvalley WTP	0	0.000	0.00	M-6

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NPDES #	REACH	NAME	CONCENTRATION	FLOW RATE	SALT LOAD	EXPLANATION
			MG/L	MGD	TONS/DAY	CODE
UTG640014	411	Dutch John WTP	0	0.000	0.00	M-6
UTG640012	600	E. Carbon City-Sunnyside CWTP	0	0.000	0.00	M-6
UTG640030	710	Emery WTP	0	0.000	0.00	M-6
UTG640039	710	Ferron WTP	0	0.000	0.00	M-6
UT0024368	710	Genwal Resources, Inc.-Crandall Canyon Mine	510	0.900	1.91	I
UTG640017	600	Green River WTP	0	0.000	0.00	M-6
UT0025232	600	Green River, City of	0	0.000	0.00	M-1
UTG790021	905	Haycock Petroleum Remediation Site	4800	0.008	0.15	I
UT0023094	600	Hiawatha Coal Co.	729	0.380	1.15	I-5E
UT0021792	411	Hollansworth & Travis	0	0.000	0.00	I-1
UTG040019	600	Horizon Coal	458	0.504	0.96	I
UTG640040	710	Huntington WTP	0	0.000	0.00	M-6
UT0024015	411	Intermountain Concrete	1800	0.070	0.50	I
UT0023922	300	International Uranium Dension Mines	0	0.000	0.00	I-2
UTG040013	600	IPA Horse Canyon	0	0.000	0.00	I-2
UT0025488	600	J.W. Operating Corp.	860	0.062	0.22	I
UT0025534	710	James Canyon Well System	224	4.900	4.58	I
UTG640023	411	Manilla WTP	0	0.000	0.00	M-6
UT0020419	300	Moab, City of	410	1.100	1.88	M
UT0024503	802	Monticello	0	0.000	0.00	M-2
UTG640015	802	Monticello City (Culinary WTP)	0	0.000	0.00	M-6
UTG040004	600	Mountain Coal Co.-Gordon Creek Mine	0	0.000	0.00	I-2
UTG640008	610	Myton Community Water System	0	0.000	0.00	M-6
UTG040010	600	NEICO	0	0.000	0.00	I-2
UT0023001	610	Neola Town Water & Sewer Assoc.	-	0.880	-	M-3
UTG790014	600	Olsen-Durrant (Former Bulk Fuel Facility)	-	0.058	-	I-3
UTG640031	710	Orangeville WTP	0	0.000	0.00	M-6
UT0000094	600	PacifiCorp-Carbon	2467	0.250	2.57	I-5B
UT0023604	710	PacifiCorp-Deer Creek	472	0.500	0.98	I
UTG040022	710	PacifiCorp-DesBeeDove	-	-	-	I-1
UTG040009	710	PacifiCorp-Hunter Coal Prep	0	0.000	0.00	I-2
UT0025607	710	PacifiCorp-Huntington	-	-	1.83	I-7
UTG040003	710	PacifiCorp-Trail Mountain	-	-	-	I-1
UT0023728	710	PacifiCorp-Trail Mountain Mine	0	0.000	0.00	I-2
UT0022896	710	PacifiCorp-Wilberg	755	0.040	0.13	I
UTG640035	600	Price City WTP	0	0.000	0.00	M-6
UT0021814	600	Price River Water Imp. Dist.	1232	1.570	8.06	M
UTG640034	600	Price River WID	0	0.000	0.00	M-6
UTG040012	600	RAG Plateau Mining Corp.	0	0.000	0.00	I
UTG130016	700	Road Creek Trout	-	-	-	I-1
UTG040005	600	Savage Industries Coal Terminal (CV-Spur)	0	0.000	0.00	I-2
UT0025224	905	Springdale	815	0.200	0.68	M
UTG640021	905	St. George WTP	0	0.000	0.00	M-6
UT0024686	905	St. George, City of	1125	9.000	42.20	M
UTG040025	600	Star Point Refuse Pile(Sunnyside Cogen)	0	0.000	0.00	I-2
UT0024759	600	Sunnyside Cogen.	0	0.000	0.00	I-2
UT0025399	710	Talon Resources	-	-	-	I-1
UTG640002	610	Tridell-Lapoint Water IDWTP	0	0.000	0.00	M-6
UTG130003	700	UDWR-Egan/Bicknell FH	186	10.140	7.87	I-5D
UTG130007	700	UDWR-Loa FH	174	8.900	4.17	I-5D

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NPDES #	REACH	NAME	CONCENTRATION	FLOW RATE	SALT LOAD	EXPLANATION
			MG/L	MGD	TONS/DAY	CODE
UTG130012	610	UDWR-Whiterocks	234	5.400	5.27	I-5D
UT0020338	411	USBOR-Flaming Gorge Dam	-	0.003	-	M-3
UTG130001	411	USFWS-Jones Hole NFH	185	7.000	5.40	I-5D
UTG640006	700	USNPS-Capitol Reef WTP	0	0.000	0.00	M-6
UTG640004	700	USNPS-Glen Canyon Hite WTP	0	0.000	0.00	M-6
UTG040024	710	Utah American Energy-Lila Canyon Mine	0	0.000	0.00	I-2
UT0025640	600	West Ridge Mine	1153	0.206	0.99	I
UTG040023	600	West Ridge Mine	-	-	-	I-1
UTG040021	600	White Oak Mine	-	-	-	I-1
UT0000035	411	Whiting Oil & Gas (formerly Equity Oil)	1330	1.210	6.71	I-5E
UT0000124	411	Whiting Oil & Gas (formerly Equity Oil)	1430	1.310	7.81	I-5E
UT0021768	411	Whiting Oil & Gas (formerlyCIMA-Sonoma)	1800	0.400	3.00	I-5E
WY0054224	401	AntiCline Disposal, LLC	<500			I-2
WY0054232	401	AntiCline Disposal, LLC	<500			I-2
WY0022888	500	Baggs, Town of		0.00	0.00	M-7
WY0020133	401	Big Piney, Town of	750.0	0.02	0.06	M
WY0028886	401	Black Butte Coal Company		0.00	0.00	I
WY0030261	401	Black Butte Coal Company		0.00	0.00	I
WY0033448	401	BP America Production Company		0.00	0.00	I-1
WY0030350	401	Bridger Coal Company		0.00	0.00	I
WY0032697	411	Chevron, Inc.		0.00	0.00	I
WY0023132	411	Church and Dwight Company, Inc.		0.00	0.00	I
WY0036021	500	Dixon, Town of (Water Treatment Plant)		0.00	0.00	I-6
WY0021938	500	Dixon, Town of	400.0	0.01	0.02	M
WY0042145	500	Double Eagle Petroleum and Mining Company	1740.0	0.18	1.31	I
WY0054038	500	Double Eagle Petroleum and Mining Company		0.00	0.00	I-2
WY0032450	401	ExxonMobil Corporation		0.00	0.00	I
WY0032689	401	ExxonMobil Corporation		0.00	0.00	I
WY0022071	411	Fort Bridger Sewer District	400.0	0.20	0.33	M
WY0022373	411	Granger, Town of		0.00	0.00	M
WY0000027	401	Green River Rock Springs JPWB		0.00	0.00	I-2
WY0020443	401	Green River, City of	650.0	1.50	4.07	M
WY0051152	401	Hodder, James		0.00	0.00	I-6
WY0000116	411	Kemmerer-Diamondville Joint Powers Board (WT	400.0	0.20	0.33	I
WY0020320	411	Kemmerer-Diamondville Joint Powers Board	700.0	0.60	1.75	M
WY0022080	401	LaBarge, Town of	700.0	0.15	0.44	M
WY0020117	411	Lyman Wastewater Lagoon	1000.0	0.20	0.83	M
WY0021997	401	Marbleton, Town of	700.0	0.30	0.88	M
WY0022896	401	Mountain View, Town of	600.0	0.30	0.75	M
WY0023124	401	Mountain Village Park				M-2
WY0052515	401	Newpark Environmental Services		0.00	0.00	I-2
WY0020311	411	PacifiCorp	1242.0	1.30	6.73	I-5B
WY0020656	401	Pinedale, Town of	150.0	0.80	0.50	M
WY0000051	411	Pittsburg and Midway Coal Mining Company	0.0	0.00	0.00	I
WY0052311	401	PTI Premium Camp Services	500.0	0.03	0.06	M
WY0035947	500	Questar Exploration and Production Company			0.00	I-2
WY0022128	401	Regency of Wyoming, Inc.	600.0	0.05	0.13	M
WY0022357	401	Rock Springs, City of	850.0	2.50	8.86	M-5
WY0023825	401	Rocky Mountain Coal Company, LLC		0.00	0.00	I

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NPDES #	REACH	NAME	CONCENTRATION	FLOW RATE	SALT LOAD	EXPLANATION
			MG/L	MGD	TONS/DAY	CODE
WY0033111	411	SF Pipeline, LLC	550.0	0.01	0.02	I
WY0026671	401	Summit Lodging	400.0	0.01	0.02	M
WY0021806	401	Superior, Town of	0.0	0.00	0.00	M-2
WY0036153	411	Travel Centers of America	0.0	0.00	0.00	I-6
WY0000086	401	Wyoming Game and Fish Department				I-7
WY0000094	401	Wyoming Game and Fish Department				I-7

APPENDIX D

USEPA NPDES List

USEPA has most recently been requested to prepare the list of the NPDES permits in the Colorado River Basin. That list will be available in the near term. Anyone desiring this list should contact Jack Barnett at (801) 292-4663 or at jbarnett@barnettwater.com

For additional information please contact:

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